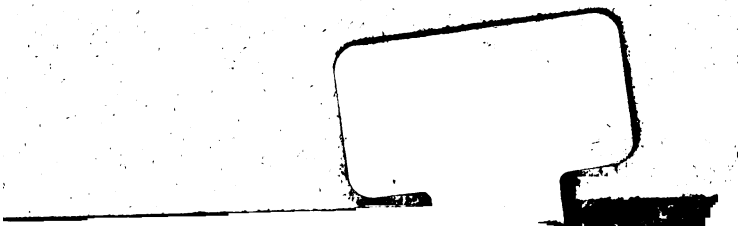


...tion.
...and School
...spector, Health

PROCEEDINGS

of the

FIFTH CONGRESS

of the

AMERICAN SCHOOL HYGIENE ASSOCIATION

VOLUME III

First Congress
Washington, D. C., March 6 and 7, 1907

Second Congress
Atlantic City, N. J., April 17 and 18, 1908

Third Congress
Chicago, Ill., February 22, 23, 24 and 25, 1909

Fourth Congress
Indianapolis, Ind., March 2, 3 and 4, 1910

Fifth Congress
New York City, February 2, 3 and 4, 1911

Published April, 1911, by the American School Hygiene Association

---

SPRINGFIELD, MASS.
AMERICAN PHYSICAL EDUCATION REVIEW
1911

Meetings.

ARTICLE XVI. The Association shall hold an annual meeting and such other meetings as they shall from time to time determine.

Officers.

ARTICLE XVII. The officers of this Association shall be a president, a vice-president and a secretary-treasurer.

ARTICLE XVIII. The officers shall be elected annually by the Council to serve for one year or until their successors are elected and installed.

Funds.

ARTICLE XIX. Funds shall be raised by annual dues of three dollars from each active member, and in such manner as shall be approved by the Council.

Amendments.

ARTICLE XX. The constitution may be amended by a two-thirds vote of the entire Council, publication in the call for an annual meeting, and a majority vote of those present and voting at such annual meeting.

LIST OF MEMBERS.

AFFLECK, G. B., A.B., Professor of Hygiene, International Y. M. C. A. Training School, Springfield, Mass.

*ALLPORT, FRANK, M.D., LL.D., Professor of Otology, Northwestern University.

ANTI-TUBERCULOSIS COMMITTEE OF ONE HUNDRED, Masonic Temple, Winston-Salem, North Carolina.

AUD, C. Z., M.D., Member State Board of Health, Cecilian, Ky.

AYRES, LEONARD P., A.M., Ph.D., Associate Director, Department of Child Hygiene, Russell Sage Foundation, New York City.

BADGER, GEORGE S. C., A.B., A.M., M.D., Physician, Boston, Mass.

BAKER, S. JOSEPHINE, M.D., Chief of Division of Child Hygiene, Department of Health, New York City.

*BALLIET, THOMAS M., A.B., A.M., Ph.D., Dean of School of Pedagogy, New York University.

BARTH, GEORGE P., B.Sc., M.D., Chief Medical Inspector of Schools, City Hall, Milwaukee, Wis.

BEACH, EVERETT C., M.D., Head, Department Physical Instruction, Los Angeles, High School.

BEIDERHASE, JOSEPHINE, Assistant Director of Physical Education, Public Schools, New York City.

BENNETT, ARTHUR E., A.M., Pd.D., Dean, School of Education, Upper Iowa University, Fayette, Iowa.

BERRY, CHARLES SCOTT, A.B., A.M., Ph.D., Assistant Professor of Education, University of Michigan, Ann Arbor.

BIGELOW, ANSON H., B.Sc., Superintendent City Schools, Lead, South Dakota.

*BIGGS, HERMAN M., A.B., M.D., LL.D., General Medical Officer, Health Department, New York City.

*BLAKE, CLARENCE JOHN, M.D., Professor of Otology, Harvard University.

BLIEM, MILTON J., M.D., San Antonio, Texas.

BOARD OF EDUCATION, Asbury Park, N. J. (Represented by Frederick S. Shepherd, Ph.D., Superintendent of Schools).

BOARD OF EDUCATION, Davenport, Iowa (Represented by Mr. Frank L. Smart, Superintendent of City Schools).

BOARD OF EDUCATION, La Crosse, Wis. (Represented by L. P. Benezet, A.B., A.M., Superintendent of Schools).

BOARD OF EDUCATION, Plainfield, N. J. (Represented by Mr. Henry M. Maxson, Superintendent of Schools).

BOARD OF SCHOOL COMMISSIONERS, Baltimore, Md. (Represented by James H. Van Sickle, A.B., A.M., Superintendent.

BOARD OF SCHOOL TRUSTEES, Lafayette, Ind. (Represented by R. F. Hight, A.B., Superintendent of Schools).

BOICE, HARRY B., A.M., M.D., Instructor in Hygiene and Director of Gymnasium, State Normal School, Trenton, N. J.

BOLIN, JAKOB, Professor of Physical Education, University of Utah, Salt Lake City.

BOOK, WILLIAM F., A.B., Ph.D., Professor of Psychology and Education, University of Montana.

BOTSFORD, CHARLES P., M.D., Superintendent of Health, Hartford, Conn.

†*BOWDITCH, H. P., M.D., D.Sc., LL.D., Professor Emeritus, Harvard Medical School.

*BOWEN, W. P., M.S., B.Pd., Professor of Physical Education, Michigan Normal College, Ypsilanti, Mich.

---

*Founding Members. †Deceased.

BOWER, EDWARD L., M.D., School Physician, Guthrie Center, Iowa.
BOYD, LOIS, M.D., Resident Physician, Winthrop College, Rock Hill, South Carolina.
BRACKEN, HENRY MARTYN, M.D., Secretary and Executive Officer, State Board of Health, Minneapolis, Minn.
BRACKETT, JEFFREY R., Director, School for Social Workers, Boston, Mass.
BRADFORD, MRS. MARY D., Superintendent of Schools, Kenosha, Wis.
BRANNAN, JOHN W., A.B., M.D., 11 West 12th Street, New York City.
BRIGGS, W. A., M.D., Member, California State Board of Health, Sacramento, Cal.
BRIGHAM, AGNES O., State Normal School, Platteville, Wis.
BRITTAIN, HORACE L., M.A., Ph.D., Superintendent of Schools, Hyde Park, Mass.
BROWN, ELIAS G., A.B., M.D., Founder and Director of "The Mountain School for Boys," Allaben, Ulster County, New York.
*BROWN, ELMER ELLSWORTH, Ph.D., LL.D., Commissioner of Education of the United States, Washington, D. C.
*BROWN, PHILIP KING, A.B., M.D., Union Square Building, 350 Post Street, San Francisco, Cal.
BURDELL, W. J., M.D., Member, State Board of Health, Lugoff, South Carolina.
BURNHAM, WILLIAM H., Ph.D., Professor of Pedagogy and School Hygiene, Clark University.
BURNS, HARRY B., M.D., Chief of School Medical Inspection, Pittsburg, Pa.
*BURRITT, OLIN HOWARD, B.A., M.A., Principal Pennsylvania Institute for the Instruction of the Blind, Overbrook, Pa.
*CABOT, ARTHUR T., A.B., A.M., M.D., Boston, Mass.
*CABOT, RICHARD C., A.B., M.D., Assistant Professor in Medicine, Harvard University, Boston, Mass.
CABOT, SAMUEL, A.B., 141 Milk Street, Boston, Mass.
CAFFEY, HUGH B., M.D., City Health Officer, Pittsburg, Kansas.
CALDERWOOD, W. R., M.D., Physician, Salt Lake City, Utah.
CALDWELL, JOSEPH S., A.B., A.M., Professor of Biology, Peabody College for Teachers, Nashville, Tenn.
CAMPBELL, W. C., Ph.B., Ph.M., Superintendent Public Schools, Niles, Ohio.
CASSIDY, HENRY A., A.M., Superintendent Public Schools, Lancaster, Ohio.
*CHANNING, WALTER, M.D., LL.D., Brookline, Mass.
CHANUTE CITY SCHOOLS, Chanute, Kansas (Represented by Mr. Homer D. Ramsey, Superintendent of City Schools).
CHAPIN, CHARLES V., M.D., Superintendent of Health, City Hall, Providence, R. I.
CHARLESTON PUBLIC SCHOOLS, Charleston, Ill. (Represented by Mr. DeWitt Elwood, Superintendent Schools).
CHEW, WILLIAM H., Member, State Board of Health, Camden, N. J.
COLEMAN, MARY CHANNING, Director Physical Education, Winthrop College, Rock Hill, South Carolina.
CONGDON, FAYETTE K., A.B., A.M., Superintendent of Schools, Northampton, Mass.
COOPER, FRANK I., Architect, Boston, Mass.
CORNELL, WALTER S., B.S., M.D., Neurologist to Division of School Inspection, Bureau of Health, Philadelphia, Pa.
CORWIN, RICHARD W., A.M., M.D., LL.D., Chief Surgeon, Colorado Fuel and Iron Co., Pueblo, Colo.

---

*Founding Members.

*CRAMPTON, C. WARD, M.D., Director Physical Training, Public Schools, New York City.

CROCKETT, MRS. S. S., Chairman, Public Health Department, National Federation of Women's Clubs, Nashville, Tenn.

*CRONIN, JOHN J., A.B., M.D., Borough Chief, Division of Child Hygiene, Department of Health, New York City.

CRUMBINE, S. J., M.D., Secretary, State Board of Health, Topeka, Kansas.

DAVIS, FRANK P., Ph.B., M.D., Superintendent, Oklahoma Institution for Feeble-minded, Enid, Oklahoma.

DEWITT, J. WALLACE, M.D., Physician, Antioch, Cal.

DICKINSON, G. K., M.D., Surgeon, Jersey City, N. J.

*DIXON, SAMUEL G., A.B., M.D., Commissioner of Health, Commonwealth of Pennsylvania.

*DREW, FRANK, A.B., A.M., Ph.D., Superintendent Schools, Granville, Mass.

EHINGER, CLYDE E., M. D., Physical Director and Instructor in Hygiene, State Normal School, West Chester, Pa.

EHLER, GEORGE W., C.E., Director Physical Education, University of Wisconsin, Madison, Wis.

*ELLIS, A. CASWELL, A.B., Ph.D., Associate Professor of Education, University of Texas, Austin, Texas.

ERD, ROBERT L., A.B., Physical Director, Michigan School for the Deaf, Flint, Mich.

FARRAND, LIVINGSTON, A.M., M.D., Professor of Anthropology, Columbia University, New York City.

*FISCHEL, W. E., M.D., Professor Clinical Medicine, Washington University, St. Louis, Mo.

*FISHER, IRVING, Ph.D., Professor of Political Economy, Yale University.

FISK, HERBERT F., D.D., LL.D., Professor of Education, College of Liberal Arts, Northwestern University, Evanston, Ill.

FITTZ, AUSTIN H., Ph.B., LL.B., Superintendent of Schools, Norwood, Mass.

FITZ, GEORGE W., M.D., Physician, Peconic, L. I., N. Y.

FOLKS, HOMER, A.B., Secretary, State Charities Aid Association, Yonkers, New York.

*FORCHHEIMER, FREDERICK, M.D., Professor, Theory and Practice of Medicine, Miami Medical College, Cincinnati, Ohio.

FRANKFORT HIGH SCHOOL DEBATING CLASS, Frankfort, Ind. (Represented by Principal C. L. Stubbs).

FRILMER, MISS HARRIET, R.N., Superintendent, Visiting Nurses' Association of Chicago, Administrator, School Nursing Work, Chicago, Ill.

FRONCZAK, FRANCIS E., A.B., A.M., M.D., LL.B., Health Commissioner, City of Buffalo, New York.

FULKERSON, CLARKE B., M.D., School Inspector and City Bacteriologist, Kalamazoo, Mich.

GAINES, ELIZABETH V., A.B., A.M., Professor of Biology, Adelphi College, Brooklyn, N. Y.

GARDNER, TERESA, Graduate Trained Nurse, Stout Institute, Milwaukee, Wis.

GILCREEST, J. E., M.D., Surgeon to Gainesville Sanitarium, Gainesville, Texas.

GILMORE, HUGH M., A.B., Superintendent City Schools, Mason City, Iowa.

*GODDARD, HENRY HERBERT, A.B., A.M., Ph.D., Director Psychological Research, Training School, Vineland, N. J.

---

*Founding Members.

GODFREY, EDWARD S., M.D., Secretary, Territorial Board of Health, Phœnix, Ariz.
GOLDSMITH, EVELYN, M., in charge of School for Crippled Children, New York City.
GREESON, W. A., A.B., A.M., Superintendent of Schools, Grand Rapids, Mich.
GREGG, FRED M., State Normal School, Peru, Nebraska.
GREIL, GASTON J., B.Sc., M.D., Chairman, Executive Committee, Anti-Tuberculosis League, Montgomery, Ala.
GRIFFITH, ALICE L., 2608 Webster Street, San Francisco, Cal.
GRIFFITH, ELBERT W., Superintendent of Schools, Glens Falls, New York.
GRIFFITH & TUCKER (Represented by Dr. George E. Tucker, County Health Officer), Riverside, Cal.
*GULICK, LUTHER HALSEY, M.D., M.P.E., Director Department of Child Hygiene, Russell Sage Foundation, New York City.
*HANUS, PAUL H., S.B., LL.D., Professor of Education, Harvard University.
†*HARRINGTON, CHARLES, A.B., M.D., Professor of Hygiene, Harvard University; Secretary State Board of Health, Boston, Mass.
HARRINGTON, THOMAS F., M.D., Medical Director, Public Schools, Boston, Mass.
HASTINGS, WILLIAM W., A.B., A.M., Ph.D., Dean, Normal School of Physical Education, Battle Creek, Mich.
HAYDEN, HERBERT B., M.A., Superintendent City Schools, Rock Island, Ill.
HECK, W. H., M.A., Professor of Education, University of Virginia, Charlottesville, Va.
HEPBRON, GEORGE T., 22 North Eighteenth Street, East Orange, N. J.
HESSLER, ROBERT, A.M., M.D., Physician, Logansport, Ind.
*HETHERINGTON, CLARK W., A.B., 5510 Washington Avenue, Chicago, Ill.
HILL, DAVID S., A.B., Ph.D., Professor of Psychology and Education, Peabody College for Teachers, Nashville, Tenn.
HILLYER, MRS. A. R., President, Civic Club, Hartford, Conn.
HINES, L. N., A.B., A.M., Superintendent Schools, Crawfordsville, Ind.
HOAG, ERNEST B., A.M., M.D., Director Physical Examinations, Public Schools and Throop Institute, Pasadena, Cal.
HOBBIE, JOHN R., A.B., M.D., Chairman, Board of Health, North Adams, Mass.
HODGSON, CASPAR W., A.B., Yonkers-on-Hudson, N. Y.
HOLTON, HENRY D., M.D., Secretary and Executive Officer, State Board of Health, Brattleboro, Vt.
HOMANS, AMY MORRIS, A.M., Director of the Department of Hygiene and Physical Education, Wellesley College, Wellesley, Mass.
HOSS, SESSLER, M.D., Muskogee, Oklahoma.
HUBBARD, CHARLES W., A.B., Boston, Mass.
HUDSON, S. B., M.D., Sanderson, Texas.
HURTY, J. N., M.D., Ph.D., State Health Commissioner, Indianapolis, Ind.
HUTCHINSON, WOODS, A.B., A.M., M.D., New York City.
HYAMS, ISABEL F., 26 Wales Street, Dorchester, Mass.
HYDE, GEORGE E., M.D., President, State Board of Health, Rexburg, Idaho.
*JACOBI, A., M.D., LL.D., Professor Emeritus, College of Physicians and Surgeons, New York City.
*JACOBS, HENRY BARTON, A.B., M.D., Secretary, National Association for the Study and Prevention of Tuberculosis, Baltimore.
JEANNOTTE, J. ADHEMAR, M.B.L. de, M.D., Leadville, Colo.

---

*Founding Members. †Deceased.

*JORDAN, EDWIN OAKES, Ph.D., Professor of Bacteriology, University of Chicago.
KEENE, CHARLES H., A.B., M.D. Supervisor of Hygiene and Physical Training, Court House, Minneapolis, Minn.
KEHEW, MRS. MARY M., Boston, Mass.
KENNEDY, L. T., M.D., Physician, Pottsville, Pa.
LABERGE, J. E., M.D., Medical Superintendent of Infectious Diseases, City Hall, Montreal, Canada.
LACHAPELLE, E. PERSILLER, M.D., President, Board of Health, Province of Quebec, Montreal.
LANGNECKER, HARRY L., A.B., M.D., Physician, Cambridge, Mass.
LEAVITT, ROBERT G., Ph.D., Head, Department of Biology, State Normal School, Trenton, N. J.
*LEE, FREDERICK S., A.B., A.M., Ph.D., Professor of Physiology, Columbia University, New York City.
LEE, JOSEPH, A.B., A.M., LL.B., Boston, Mass.
LEWIS, HOMER P., A.B., Superintendent of Schools, Worcester, Mass.
LISTER, W. SHERMAN, Superintendent of Schools, Ionia, Mich.
LOVEJOY, HERMAN S., B.S., M.A., Superintendent of Schools, Branford, Conn.
*LOVETT, ROBERT W., A.B., M.D., Assistant Professor Orthopedic Surgery, Harvard University, Boston.
LUCKEY, GEORGE W. A., B.S., A.B., Ph.D., Head Professor of Education, University of Nebraska, Lincoln, Neb.
LUSK, GRAHAM, Ph.B., A.M., Ph.D., Professor of Physiology, University and Bellevue Hospital Medical College, New York City.
MACKEY, EBENEZER, A.B., Ph.D., Superintendent of Schools, 314 Hamilton Avenue, Trenton, N. J.
MACMURCHY, HELEN, M.D., Medical Officer to the Board of Education, Toronto, Canada.
MARK, E. H., B.S., M.S., M.D., Superintendent of Schools, Louisville, Ky.
MARTIN, ELIZABETH L., M.D., School Physician and Instructor in Hygiene, Margaret Morrison Carnegie School, Pittsburgh, Pa.
*MARTIN, GEORGE H., A.M., Litt.D., Treasurer and Agent, Massachusetts Board of Education, Boston.
MARVEL, FREDERICK W., Ph.B., Professor of Physical Training, Brown University, R. I.
MAYS, VERNON G., Ph.B., A.M., Principal, High School, Lincoln, Neb.
MCCALLIE, JOSEPH M., A.B., Principal, Centennial School, Trenton, N. J.
MCCARVER, JAMES W., M.D., County Health Officer, Brownwood, Texas.
MCCOLLOM, JOHN HILDRETH, M.D., Sc.M., Superintendent and Medical Director, Boston City Hospital, Boston, Mass.
*MCCURDY, JAMES H., A.M., M.D., M.P.E., Director of Physical Education, International Y. M. C. A., Training School, Springfield, Mass.
MCKEAG, ANNA JANE, Ph.D., Professor of the History and Principles of Education, Wellesley College, Mass.
*MCKENZIE, R. TAIT, B.A., M.D., Professor of Physical Education, Director of Department, University of Pennsylvania.
MCKINSTRY, HELEN M., Director Physical Training for Girls, Pratt Institute, Brooklyn, N. Y.
METZDORF, AUGUST E., B.P.E., Director Physical Training, Public Schools; Superintendent City Playgrounds, Springfield, Mass.
*MEYER, ADOLPH, M.D., LL.D., Professor of Psychiatry, Johns Hopkins University, Baltimore, Md.
*MEYLAN, GEORGE L., S.B., A.M., M.D., Adjunct Professor Physical Education, Columbia University, New York City.

*Founding Members.

MINOT, JAMES J., A.B., M.D., Member of Executive Committee, Boston Association for Relief and Control of Tuberculosis, 188 Marlboro Street, Boston, Mass.
MOIR, J. G., M.D., Deming, New Mexico.
MOLYNEUX, A., Superintendent of Schools, Logan City, Utah.
MONTCLAIR BOARD OF HEALTH (Represented by Dr. Levi W. Halsey, Treasurer, Montclair, N. J.).
MONTGOMERY, JESSE B., Principal and Critic, Grammar Department, State Normal School, Terre Haute, Ind.
MORE, C. W., M.D., President, School Board, Everleth, Minn.
MORRISON, JAMES H., A.M., M.D., Health Commissioner, Bartholomew County, Hartsville, Ind.
MORTON, ROSALIE S., M.D., Chairman, Public Health Education Committee, A. M. A., New York City.
MOTT, T. A., A.M., Superintendent of Schools, Richmond, Ind.
*MUSSER, J. H., M.D., LL.D., Professor of Clinical Medicine, University of Pennsylvania.
NEFF, JOSEPH S., A.M., M.D., Director Public Health and Charities, City Hall, Philadelphia, Pa.
NEILSON, A. F. O., M.D., Idaho Drug Co., Oakley, Idaho.
NEWMAYER, S. W., A.B., M.D., Inspector in Charge, Division Infant Mortality, Bureau of Health and Charities, Philadelphia, Pa.
NEWTON, RICHARD COLE, A.B., M.D., Practitioner of Medicine, 42 Church Street, Montclair, N. J.
NORTH CAROLINA STATE BOARD OF HEALTH (Represented by W. S. Rankin, M.D., Secretary, Raleigh, N. C.).
NURSES' SETTLEMENT (Represented by Miss E. A. Gulley, School Nurse, Richmond, Va.
OREGON LIBRARY COMMISSION (Represented by Miss Cornelia Marvin, Secretary, The State House, Salem, Oregon.
ORTON, ELLSWORTH, M.D., City Health Officer, Pontiac, Mich.
OVERLOCK, MELVIN F., M.D., State Inspector of Health, Worcester, Mass.
PATTEN, ELMER E., Mayor, Ph.G., Ph.C., M.D., City Health Officer, Imperial, California.
PEEK, LEON ASHLEY, M.D., Physician, West Palm Beach, Fla.
PERKINS INSTITUTION FOR THE BLIND (Represented by Edward E. Allen, Director, South Boston, Mass.).
PLEASANTS, J. HALL, A.B., M.D., Instructor in Medicine, Johns Hopkins University, Baltimore, Md.
PORTER, SIDNEY D., M.D., State Sanitarian, Louisiana State Board of Health, New Orleans, La.
PORTSMOUTH TEACHERS' ASSOCIATION (Represented by Miss Annie L. McDonough, Secretary-Treasurer, Portsmouth, N. H.).
*PORTER, W. T., M.D., Professor of Comparative Physiology, Harvard Medical School.
PRATT, FREDERICK H., A.M., M.D., Instructor in Physiology and Hygiene, Wellesley College, Wellesley, Mass.
PRATT, JOHN S. B., M.D., General Health and Sanitary Officer, Territorial Board of Health, Honolulu, Territory of Hawaii.
PROBST, C. O., M.D., Secretary Ohio State Board of Health, Columbus, Ohio.
PUTNAM, CHARLES P., A.M., M.D., Chairman, Trustees of Boston Children's Institution, Boston, Mass.
PUTNAM, HELEN C., A.B., M.D., Rhode Island Avenue, Providence, R. I.
PUTNAM, JAMES J., A.B., M.D., Professor Nervous Diseases, Harvard Medical School.

*Founding Members.

RALSTON, W. E., D.V.M., B.A., Agr., Professor of Physiology and Bacteriology, Washington State College, Pullman, Washington.
RAMALEY, FRANCIS, M.S., Ph.D., Professor of Biology, University of Colorado, Boulder, Colo.
RAMSEY, ARTHUR, Principal Fairmont Seminary, Washington, D. C.
RAVENEL, MAZYCK P., M.D., Professor of Bacteriology; Director, State Hygienic Laboratory; Chairman, Hygiene Committee, University of Wisconsin, Madison, Wis.
RAWLINGS, I. D., M.D., Assistant Chief Medical Inspector, Department of Health, Chicago, Ill.
RAYCROFT, JOSEPH E., A.B., M.D., Associate Professor of Physical Culture and Examining Physician, University of Chicago.
REED, WILLIAM A., M.D., County Health Officer, Livingston, Tenn.
REID, GEORGE W., Superintendent of City Schools, Texarkana, Ark.-Tex.
RISLEY, SAMUEL D., A.M., Ph.D., Surgeon Will Eye Hospital, etc., University of Pennsylvania.
ROBINSON, ERNEST W., Superintendent of Public Schools, Webster, Mass.
†ROBINSON, FRANKLIN C., A.B., A.M., LL.D., Professor Chemistry and Mineralogy, Bowdoin College.
ROGERS, BRADLEY C., A.B., Principal of High School, Wayland, Mass.
ROTCH, THOMAS MORGAN, M.D., Physician, Boston, Mass.
ROYER, B. FRANKLIN, M.D., Chief Medical Inspector, Pennsylvania Department of Health, Harrisburg, Pa.
SARGENT, DUDLEY A., A.M., M.D., Sc.D., M.P.E., Director Hemenway Gymnasium, Harvard University, Cambridge, Mass.
SAVAGE, WATSON L., A.B., A.M., M.D., President, New York Normal School of Physical Education, New York City.
SCHENCK, HERBERT D., 75 Halsey Street, Brooklyn, N. Y.
SCHULTZ, FREDERIC W., B.A., M.D., Instructor in Pediatrics and Physiological Chemistry, University of Minnesota, Minneapolis, Minn.
SEAGER, GEORGE B. M., M.D., Member, Board of Education; Health Officer, Adrian, Mich.
SEDGWICK, J. P., B.Sc., M.D., Clinical Instructor in Diseases of Children, University of Minnesota, Minneapolis, Minn.
*SEERLEY, HOMER, H., B.Ph., B.A., LL.D., President State Teachers College, Cedar Falls, Iowa.
SEYMOUR, R. FAYETTE, B.P.E., Professor of Physical Training and Athletics, Iowa State Teachers College, Cedar Falls, Iowa.
SHALEY, FREDERIC W., A.B., M.D., Health Commissioner, Vigo County, Terre Haute, Ind.
SHAW, J. HOLBROOK, M.D., Medical Inspector, Schools of Plymouth, Plymouth, Mass.
SHIPLEY, ALFRED E., M.D., Supervisor, Division of Child Hygiene, Department of Health, New York City.
SKARSTROM, WILLIAM, M.D., Instructor in Physical Education, Columbia University, New York City.
SLAUSON, HERBERT M., Ph.B., Superintendent of Schools, Ann Arbor, Mich.
*SMALL, WILLARD S., A.B., A.M., Ph.D., Principal Eastern High School, Washington, D. C.
SMART, ISABELLE THOMPSON, M.D., Medical Examiner Mentally Deficient Children, Department of Education, New York City.
SMITH, HENRY L., A.B., A.M., Superintendent of City Schools, Bloomington, Ind.
SMITH, HENRY M., M.D., Professor of Ophthalmology, Long Island College Hospital, Brooklyn, N. Y.
SNEDDEN, DAVID, Ph.D., Commissioner of Education, Mass.

*Founding Members. †Deceased.

SNEED, C. M., M.D., Medical Inspector, City Public Schools, Jefferson City, Mo.

SNOW, WM. F., A.M., M.D., Associate Professor of Hygiene, Stanford University, Cal.

STAGG, AMOS ALONZO, A.B., Professor and Director, Division of Physical Culture and Athletics, University of Chicago, Chicago, Ill.

STANDISH, MYLES, A.B., A.M., M.D., Professor of Ophthalmology, Harvard Medical School.

STATE BOARD OF EDUCATION (Represented by Walter R. Ranger, Secretary, State House, Providence, R. I.).

STATE NORMAL SCHOOL, Oneonta, N. Y., Dr. Percy I. Bugbee, Principal.

STECHER, WM. A., Director of Physical Education, Public Schools, Philadelphia.

STERLING, E. BLANCHE, M.D., Instructor in Physical Education, Wellesley College, Wellesley, Mass.

STONEROAD, REBECCA, M.D., Director of Physical Training, Public Schools, Washington, D. C.

*STOREY, THOMAS A., M.D., Ph.D., Professor and Director Department of Physical Instruction and Hygiene, College of the City of New York.

*STORROW, JAMES J., A.B., Boston, Mass.

STOVAL, A. M., M.D., Health Officer, Walker County, Jasper, Ala.

*STURGIS, R. CLIPSTON, B.A., Chairman Board of Schoolhouse Commission, Boston, Mass.

SUPERINTENDENT OF INSTRUCTION, Board of Education Building, St. Louis, Mo. (Represented by Mr. Ben Blewett).

THOMPSON, S. H., A.B., A.M., Superintendent City Schools, Hastings, Neb.

THOMPSON, W. S., A.B., A.M., M.D., Chairman, Board of Education, Augusta, Maine.

THORNBURY, W. Y., B.S., Superintendent of Schools, Texarkana, Texas.

THORNDIKE, EDWARD LEE, A.B., A.M., Ph.D., Professor of Educational Psychology, Teachers College, Columbia University.

TOEPEL, THEODORE, M.D., Director of Hygiene and Physical Training, Public Schools, Atlanta, Ga.

TOWN SCHOOL COMMITTEE, Meriden, Connecticut (Represented by William P. Kelly, Superintendent of Schools).

TOWNSEND, DAVID, A.B., M.D., Physician, Tuberculosis Department, Boston Dispensary, Boston, Mass.

TRACEY, WILLIAM J., M.D., Norwalk, Conn.

TRUSLOW, WALTER, M.D., Private Orthopedic Practice, Brooklyn, N. Y.

TWITMYER, GEORGE W., A.M., M.S., Ph.D., Superintendent Public Schools, Wilmington, Del.

TYVAND, JAMES C., M.D., Cheyenne Wells, Colo.

VAN INGEN, PHILIP, A.B., M.D., Attending Physician, Babies' Hospital, O. P. D.; Assistant Attending Physician, St. Mary's Free Hospital for Children, New York City.

VANDER VEER, A., A.M., M.D., Ph.D., LL.D., Surgeon, Albany, N. Y.

VERNER, ARTHUR, A.B., Superintendent Schools, Hoopeston, Ill.

*WALCOTT, HENRY P., A.B., M.D., LL.D., Chairman State Board of Health, Cambridge, Mass.

WANAMAKER, JOHN, Philadelphia, Pa.

WARDEN, RANDALL D., B.S., Director of Physical Training, Public Schools, Newark, N. J.

WATSON, JAMES M., M.D., Medical Inspector of Schools; Physician to Board of Health, Falmouth, Mass.

WATT, WILLIAM E., Principal, Graham School; President, *The World Chronicle,* Chicago, Ill.

---

*Founding Members.

WEAVER, DANIEL W., M.D., County Health Commissioner, Greensburg, Ind.
*WELCH, WILLIAM H., A.B., A.M., LL.D., Professor of Pathology, Johns Hopkins University, Baltimore, Md.
*WHEELWRIGHT, EDMUND MARCH, A.B., Architect, Boston, Mass.
*WHIPPLE, GUY MONTROSE, A.B., Ph.D., Assistant Professor of Education, Cornell University, Ithaca, N. Y.
WHITTIER, FRANK N., A.M., M.D., Professor of Pathology and Bacteriology, College Physician, Director of Gymnasium, Bowdoin College.
WILLIAMS, ENNION G., M.D., State Commissioner of Health, Richmond, Va.
WILLIS, ROYAL H., M.D., Medical Inspector in Charge, Division of Child Hygiene, Department of Health, Brooklyn, N. Y.
WILLISON, A. C., A.B., Superintendent of Schools, Cumberland, Md.
WILSON, MARGARET B., A.B., M.Sc., M.D., Professor of Physiology and Hygiene, Normal College of the City of New York, New York City, N. Y.
WINTERBOTHAM, J. H., M.D., County Health Officer, Salina, Kansas.
*WITMER, LIGHTNER, B.A., M.A., Ph.D., Professor of Psychology, University of Pennsylvania, Laboratory of Psychology, College Hall.
WOOD, THOMAS D., A.M., M.D., Professor of Physical Education, Columbia University.
*WOODBRIDGE, S. H., M.A., Associate Professor, Massachusetts Institute of Technology, Boston, Mass.
WOODWARD, WILLIAM C., M.D., LL.M., Health Officer, District of Columbia, Washington, D. C.
YOUNG, EVALINE, Head of Physical Training, High School for Girls, Philadelphia.
YOUNG FOLKS' (Public) LIBRARY, La Junta, Colo. (Represented by Thomas T. Woodruff, LL.B.).
ZESINGER, FRANK O., Steward, Girard College, Philadelphia, Pa.

*Founding Members.

PROGRAM OF THE FIFTH CONGRESS OF THE AMERICAN SCHOOL HYGIENE ASSOCIATION, FEBRUARY 2, 3 and 4, 1911.

February Second, Thursday Morning

10.00 a.m. Introductory Remarks, by the President, "Measurements as Applied to School Hygiene," LUTHER H. GULICK, Director of Department of Child Hygiene, Russell Sage Foundation, New York City.
10.30 a.m. "School Instruction in Sex-Hygiene," CHARLES W. ELIOT, President Emeritus, Harvard University. (To be read by Dr. Gulick.)
11.00 a.m. "Vital Results Obtained in a Kindergarten from One Year's Work in the Open Air," WILLIAM E. WATT, Principal, Graham School, Chicago.
11.30 a.m. "An Inquiry into the Problem of Desks for School Children," WILLIAM A. STECHER, Director of Physical Education, Public Schools, Philadelphia, Pa.

February Second, Thursday Afternoon

2.00 p.m. "School Inspection in Small Towns," ARTHUR T. CABOT, Surgeon, Boston, Mass.
2.30 p.m. "Evidences that the School Nurse Pays," SAMUEL W. NEWMAYER, Inspector in Charge of Division of Infant Mortality, Bureau of Health and Charities, Philadelphia.
3.00 p.m. "Contagious Diseases, Their Relative Communicability, Dissemination and Prevention," ABRAHAM JACOBI, Professor Emeritus, College of Physicians and Surgeons, New York City.
3.30 p.m. "Some Suggestions for a Course of Study in Hygiene," L. N. HINES, Superintendent of Schools, Crawfordsville, Indiana.

February Second, Thursday Evening

8.15 p.m. Business Meeting of the Association. Open to members only.
1. Meeting of the Association.
2. Meeting of the Council.

February Third, Friday Morning

10.00 a.m. "Good and Bad Forms of Record Keeping," WALTER S. CORNELL, Physician, Philadelphia.
10.30 a.m. "How to Find the Feeble-Minded Child," HELEN MACMURCHY, Medical Officer to the Board of Education, Toronto, Canada.
11.00 a.m. "Recent Studies of Fatigue in Relation to the Need of Oxygen," WILLIAM H. BURNHAM, Professor of Pedagogy and School Hygiene, Clark University.
11.30 a.m. "The Formation and Functions of Hygiene Committees for Universities," MAZYCK P. RAVENEL, Director, Wisconsin State Hygienic Laboratory, University of Wisconsin, and WILLIAM D. FROST, Associate Professor of Bacteriology, University of Wisconsin.

February Third, Friday Afternoon

2.00 p.m. "Should the Examination of the Eyes of School Children be Conducted by the Teacher or the School Physician?" MYLES STANDISH, Williams Professor of Ophthalmology, Harvard Medical School.

2.30 p.m. "The Boy and the Cigarette: How Best Present the Evils of Smoking to Adolescent Boys," WILLARD S. SMALL, Principal, Eastern High School, Washington, D. C.

3.00 p.m. "The Work of the Public Health Education Committee of the American Medical Association," ROSALIE SLAUGHTER MORTON, Chairman, Public Health Education Committee, American Medical Association.

3.30 p.m. "The Sanatorium School," HENRY BARTON JACOBS, Secretary, National Association for the Study and Prevention of Tuberculosis, Baltimore, Md. Read by title.

February Third, Friday Evening

8.15 p.m. 1. "The Consecration of the Affections" (Often misnamed Sex-Hygiene), RICHARD C. CABOT, Assistant Professor of Clinical Medicine, Harvard University.

2. "The Physical Condition of Country Children as Compared with that of City Children," WOODS HUTCHINSON, Physician, New York City. Read by title.

3. "How a Community May be Educated to Support Medical and Dental Examination and Treatment," WILLIAM H. ALLEN, Director, Bureau of Municipal Research, New York City.

4. "What Our Cities are Doing for the Health of Our Children," LUTHER H. GULICK, Director, Department of Child Hygiene, Russell Sage Foundation, New York City.

February Fourth, Saturday Morning

10.00 a.m. "Proper Sanitation of the Schoolroom," LYMAN A. BEST, Principal Grammar School No. 108, Brooklyn, N. Y.

10.30 a.m. Report of Chairman of "Committee on the Standardization of School Books," WILLIAM H. BURNHAM, Professor of Pedagogy and School Hygiene, Clark University.

11.00 a.m. Report of Chairman of Committee on "Status of Medical Inspection in America," JOHN J. CRONIN, Borough Chief, Division of Child Hygiene, Department of Health, New York City.

11.30 a.m. "Individual Instruction in Personal Hygiene," THOMAS A. STOREY, Professor and Director of Physical Instruction and Hygiene, College of the City of New York.

12.00 m. Proposed Legislation.

1. A Bill for the Employment of a Whole-time Medical School Inspector and Health Officer, and

2. An "Act to Prohibit the use of Unsanitary or Unsafe Buildings or Premises for School Purposes," H. M. BRACKEN, Secretary and Executive Officer, State Board of Health, Minnesota. Read by title.

"A Brief Review of the Situation in San Francisco of the Questions of Interest to the American School Hygiene Association," PHILIP KING BROWN, Professor of Medicine, Polyclinic Post-Graduate School, San Francisco. Read by title.

"Status of School Hygiene in Tennessee," DAVID SPENCE HILL, Professor of Psychology and Education, Peabody College for Teachers, Nashville.

"Status of School Hygiene, Glens Falls Public Schools," ELBERT W. GRIFFITH, Superintendent of Public Schools, Glens Falls, N. Y. Read by title.

Papers Presented Thursday Morning, February 2.

INTRODUCTORY REMARKS BY THE PRESIDENT: MEASUREMENTS AS APPLIED TO SCHOOL HYGIENE.

LUTHER H. GULICK, M. D., RUSSELL SAGE FOUNDATION, NEW YORK CITY.

In calling to order this Fifth Annual Congress of the American School Hygiene Association, I wish to express to the New York Academy of Medicine our appreciation of their courtesy in inviting us to meet, without expense, in this building, with its splendid record of service to the cause of medicine and to human kind, and its long list of physicians who have been and are making common cause with all those who aim not merely at the cure and prevention of disease, but even more at the upbuilding of human vitality. We are proud that one of our officers is also one of theirs —Dr. Abraham Jacobi.

I cannot let this occasion pass without drawing attention to what I believe to be a fundamental need, not only in school hygiene but in all that proudly marches under the name of science. I refer to the need for definite measurements of results already obtained, measurements without which neither medicine nor education can ever become scientific. I do not need to remind you that it was through the use of measurements that alchemy became chemistry, astrology became astronomy, physics grew out of mystery. The great need of the school hygiene course to-day, as well as the greatest need of education itself, is not authority nor philosophy; it is a need for definite methods of measuring the effects of present systems and practices.

I am sure that the occasion has now so far gone by that I may speak, without venturing beyond the limits of personal courtesy, of a conversation which took place between Dr. William H. Maxwell and myself at the time I became director of physical training in the New York Public Schools—a conversation which he may have forgotten. I said:

"Dr. Maxwell, let us take all of the schools in several sections of the city—enough different sections so that the test will be a fair one—and do away with physical training in half of these schools,

leaving it in operation in the other half; all other conditions to be the same in both schools. Then we shall see what physical training really accomplishes; we shall know whether the boys and girls in the schools having physical training become taller and stronger than the boys and girls in the schools not having physical training."

Dr. Maxwell answered: "The plan is impossible. People would protest that their children were being experimented upon. The public demands absolute knowledge on the part of the instructors; experimentation would not be tolerated. You are employed to take charge of the physical training because it is believed that you know your business—that you have accurate information as to the effect of the things you are undertaking to do."

"But," I said, "I do not know the actual results of such work as this; nobody knows. I believe my methods are right, but I want to find out definitely, by making comparative measurements."

"No, it would never do," was Dr. Maxwell's reply. "Any school administrator who worked on the basis you propose would not only be attacked by public opinion, but he would be put out of any position of responsibility."

Dr. Maxwell was right. This is in general the attitude of the public to-day; yet progress is not possible in school hygiene or in any other educational work if it is demanded that school men shall have accurate knowledge which they have had no opportunity to secure.

In order to make satisfactory progress along the line of school hygiene, there are many questions that need to be definitely settled. Most of these questions are fundamental not only with reference to school hygiene and education, but with reference to human progress and intellectual activity.

For example, what is the best age for a child to enter school? This is a question that could be definitely answered if we could secure adequate data on the subject. Galton and Karl Pearson have given us the tools, life itself gives us the material, for obtaining such data. We need only the opportunity. I venture the assertion that almost every person in this room has convictions upon the subject and yet that these convictions are based upon a few personal experiences in each case. Physicians tend to put the best age for entering school rather high; school men tend to put it low. In my own case, as a father, I was influenced by my study of medicine to believe that one of the perils of the age was forcing children to go to school too early; that school routine at six years of age was dangerous to a highly organized girl, and that it was a biological crime to force such a child to sit still when all her instincts commanded her to wriggle. Therefore my child was in school very little until she was eight years old. Even at

that age she had already passed the best years for acquiring languages, either by speaking or writing. She has been "over age" all during her school life. I may have done her a great wrong.

My point is this: that neither school men nor physicians nor parents are competent of judging such questions as this *ex cathedra*. Theories and convictions can never solve such problems; their only solution lies in a searching analysis of existing conditions, in measuring results in a sufficient number of cases to arrive at definite conclusions. Such investigations should be conducted in accordance with modern scientific methods.

It is concerning the most fundamental questions, moreover, that we are still at sea. We do not know the number of hours a child should study each day in order to make the most progress at each age. There is no one trying to find out, so far as I know. We do not know how many subjects a child can study to advantage at each age. We do not even know the most effective and economic size for a class at various ages. It might be, for example, that in a class of seventy children each child would get so little instruction that a number of them would be held back; and this would cost the school system more than if there had been only fifty in the class. We do not know the number of months in the year that children should attend school; yet we compel all children to go to school upon the assumption that we do know.

We do not know the proper length for each period of attention in different subjects. That is, in arithmetic a child of ten years might be able to give only ten minutes' consecutive attention without fatigue; whereas in history the same child might spend an hour to advantage. We do not know how much moisture there should be in the air of the schoolroom, nor the relation of the temperature and humidity of the atmosphere to mental fatigue and intellectual effort. We do not know fully the degree to which it is worth while to study when we are fatigued. I do not mean that we cannot push ourselves beyond the point of fatigue; but that, considering children and adults merely as machines, there is a point beyond which it does not pay to push, since we get only a diminishing return.

I might easily spend all the time available for these introductory remarks in enumerating the underlying problems connected with the education and the health of children which are as yet only matters of theory. We have thus far no units of measurement by which we can tell whether or not we are making progress in educational methods; yet the education of our children is the largest and in many respects the most important occupation in which the civilized world is engaged. There is no more fertile field in the whole world of scientific activity than the work of bringing the young human being into satisfactory adjustment with the life he is to lead.

In the United States alone, we are spending about five hundred million dollars a year on public education; this does not include the vast sums spent by the great endowments, by privately established institutions for higher learning, or by private schools. Of nearly thirty-five millions of dollars spent for education in New York City last year, hardly a dollar was expended for the purpose of measuring the results we are getting. This was not because our superintendent of schools did not see the need for such measurements; he has seen the need, and has appealed without success to the Board of Estimate and Apportionment for funds which would enable him to provide the necessary equipment for securing these data. We see the significance of examining our coal to be sure that we are getting the best and the cheapest; we do not see the significance of examining the output of our school system, to be sure that we are getting the best results from our expenditure.

Can one of you here to-day name an educational endowment, a school of pedagogy, or any other agency that is collecting and making available the evidence on any one of these great questions? There are several great funds of ten, twenty-five, fifty millions of dollars available for research, for giving salaries to retiring professors, for supporting education in the South—admirable purposes, all of them,—but does there exist a single endowment of any amount whatever for the purpose of ascertaining what has been accomplished with the hundreds of millions already spent in education? An endowment similar to that of the General Educational Board, which should devote its income, not to the support of education, but to establishing modes of measuring progress, and to the application of these measurements in such a way as to render effective the great mass of educational experience already in existence, would, it is safe to say, revolutionize the status of education in a single generation and establish it upon a scientific basis.

Am I overstepping the facts when I say that there is scarcely a city in America that is satisfied with its public schools? Here in New York City an investigation has been proposed; and those who follow educational matters know that in city after city severe criticisms of the school systems are constantly coming up. Even school men themselves disagree when they come together to discuss these questions; you cannot get a group of educational people together without having a controversy upon some one of these problems. As individuals, in fact, we cannot settle these matters to our own satisfaction. They can only be settled by ascertaining results—by measurements of what we are doing.

SCHOOL INSTRUCTION IN SEX-HYGIENE.

CHARLES W. ELIOT, PRESIDENT EMERITUS, HARVARD UNIVERSITY, CAMBRIDGE, MASS.

In order to make head against the horrible evils which accompany men's profligacy and women's prostitution, and to prevent the moral and physical disasters which result from young men's and young women's ignorance about the natural processes of reproduction in the human species and about the laws of health in those processes, it is indispensable that systematic instruction should be given to all children and young people in the processes of reproduction and growth in plants and animals, in the general rules of hygiene, in the natural, wholesome processes of reproduction in the human species, and, at last, in the diseases and social disorders which follow violations of nature's laws concerning the relations of the sexes. The bitter experience of the Christian world in regard to the venereal diseases and their consequences demonstrates this proposition.

Whenever anyone undertakes to discuss this subject in public, he is met by two adverse opinions which are firmly held by multitudes of well-meaning people. The first is the opinion that these are unclean subjects, about which the less said the better. This is the policy of silence concerning all sexual relations and processes, natural or unnatural, rightful or sinful, which has prevailed for centuries in both barbarous and civilized countries. There is but one thing to be said about this policy of silence, namely, that it has failed, everywhere and always. It has not prevented the spread and increase of sexual wrong-doing and of the horrible resultant diseases, degradations, and destructions. For the prevention and eradication of any great social or governmental wrong, publicity, discussion, and the awakening of a righteous public sentiment in the great mass of the people concerned have always been, and must always be, necessary. The second adverse opinion is, that the necessary instruction on these subjects should be given to children and young persons by their parents, and by them alone. This opinion is sound to this extent, that in cultivated and refined families, in which the parents possess sufficient knowledge of the whole subject, the needed instruction will best come to the children through the mother and the father, beginning at a tender age. All children ask questions on this subject. Their curiosity is roused early, and is usually very pointedly expressed. It is roused, for example, when another baby arrives in the family; but it has been the practice in many families that do not lack intelligence to put off the children with fables or silly stories, or to hush their

inquiries. The inquiring child is told that the doctor or the nurse brought the baby, or that a stork brought it. The asking of such questions should invariably be the mother's precious opportunity to describe to the child, with delicacy and reserve, but truthfully, the mother's part in the production of the human infant. By so doing the mother will establish a new bond between herself and her child, and will acquire a strong claim on his abiding affection. Every father competent for the task should see that his boys understand the natural and wholesome process of reproduction, and the great physical dangers which accompany violations of the moral law in this respect. He should see that they know that continence is absolutely healthy, and, indeed, is indispensable to the highest attainments in bodily strength and endurance. He should make sure that his boys understand what honor requires of a man in his relations to women, and that chastity is just as admirable and feasible in a man as in a woman, and just as necessary for the protection of family life and the eradication of the very worst evils which now degrade and poison civilized society. It is quite true that all this instruction will come best, whenever possible, from loving fathers and mothers to their own offspring; because it will then be given intimately, privately, and with tenderness and purity.

Inasmuch, however, as the great majority of parents do not now possess the necessary knowledge, or the faculty of expression necessary for imparting it, and there are many families that have lost father or mother or both, society must for the present rely in the main on the schools to give this instruction, which is, indeed, indispensable for the salvation of civilization.

It is, however, a very serious problem how to give the needed instruction in sex-hygiene in all the schools, public, private, and endowed. No one is competent to-day to lay down a fixed and final program. The programs for this subject must be experimental or tentative for many years to come. All that can be done at present is to indicate the general lines of the promising experiments on this difficult subject. Innumerable experimenters must in time work out the details with insight, patience, and skill. The general lines may, however, be laid down with a reasonable degree of confidence. They are as follows:

1. It is through the ample and prolonged teaching of natural history that the necessary knowledge is to be conveyed to the children, beginning at tender years with the teaching of botany, and going on to the elements of zoölogy, both subjects being taught in the most concrete manner possible with incessant illustration indoors and out-of-doors, not during the whole school year, but at those seasons when adequate illustrations and demonstrations are most feasible and convenient. This instruction should be associated in all schools with the teaching of pure and

applied geography, and in rural schools with the teaching of agriculture.

2. Throughout this long course of natural history instruction demonstrations of the various modes of transmitting life should frequently occur, the transmission of life being the highest and ultimate bodily function of every plant and every animal, including man. There is a great body of fresh knowledge on this subject waiting to be given to children and youth, all of it capable of demonstration through the senses, aided or unaided, and all supplying admirable training for eye and hand. Thus, all the various processes of reproducing plant-life by the division of a cell, by the creation of new independent cells, by the shooting or rooting of some part of a plant to create an independent plant, as by bulbs, tubers, or even parts of a stalk or leaf, by the union of two cells, or the fertilization of one cell by another cell—all these processes can be made intensely interesting to a child; and such instruction can be spread through several years at appropriate seasons without ever leaving the vegetable kingdom. In flowering plants the fertilization of the embryo-sac by pollen—a powder discharged from the anther of a flower—may be illustrated in operations which the children themselves can perform. The carrying of pollen from one flower to another by insects or by the wind emphasizes the general fact that plants are fixed, while animals have motion. The bi-sexual structure of plants is in itself a fascinating subject of study for children and youths; and through it all runs the thought that nature provides elaborately and beautifully for the precious transmission of life. In later years of the school course the diverse methods of reproduction in animals will afford a long course of instruction, involving the structure and function of many different sorts of animals, and of many different kinds of reproductive organs. The innumerable devices for effecting fecundation and for feeding the embryo, and the various arrangements for feeding the young and bringing up families, afford an endless variety of interesting subjects for observation and discussion. The nesting habits of birds and their care of offspring are highly instructive and easy to exhibit. Here again the main object of study should be the infinite variety and elaboration of nature's processes for the transmission of life. These subjects, if properly taught with collecting box, scalpel, microscope, and paper and pencil, are just as pure and innocent for children under thirteen as chemistry and physics are. There is nothing sensual or unclean about them, nothing which does not tell of order, purpose, inventiveness, adaptation, coöperation, and achievement. Through much of the botanical instruction and more of the zoölogical runs the thought that the transmission of life requires two individuals of different quality. Children

should be made thoroughly acquainted with this principle before any sexual emotions begin to stir in them.

3. If strong foundations have been laid through these botanical and zoölogical studies before the age of puberty, it will not be difficult to take up in secondary schools the study of the normal functions of the human body in health, of the perturbations caused by some of the common diseases, of the sources or causes of disease including the recognized contagions and the modes of infection, of the means of resisting disease and producing immunity, and finally, of the functions of government in regard to preventive medicine, and the means of promoting the public health. Among the contagions which ought to be described and illustrated should be included the contagions of syphilis and gonorrhea, from which proceed some of the most horrible evils which afflict modern society, evils not fully known except to physicians, and by many ordinary people, particularly women, quite unsuspected. All young men and women should be well informed on these subjects before they leave their secondary schools; but from the time of entrance to secondary schools all such instruction should be given separately to girls by women and to boys by men.

Since the majority of American children never enter the secondary schools, the general rules concerning cleanliness, diet, fresh air, and the elementary facts on sex-hygiene should be stated concisely and frankly to all children just before they reach the age-limit of compulsory education.

4. All schools should teach explicitly in due season those elements of good manners and customs which have to do with health and the preservation of bodily and mental purity. They should teach habitual cleanliness of the body and particularly of the hands and face, and point out the importance of this cleanliness in the avoidance of disease. They should teach household cleanliness as regards clothes, furniture, and utensils, and the reasons for keeping the dwelling free from dust, dirt, insects, and vermin. They should show the reasons for avoiding contact with, or close approach to, persons who are unclean or who are suffering from colds, sores, coughs, fevers, or any other illness. They should point out the dangers of losing self-control through the use—even the rare use—of alcohol or of drugs which take strong effect on the nervous system. They should discountenance rough or boisterous play between boys and girls or young men and young women, and teach each sex to avoid, in general, bodily contact with persons of the opposite sex. Delicacy and reserve are parts of good manners; but they are also highly protective qualities. On the other hand, a coarse familiarity between the sexes is not only bad manners, but a real provocative to wrong-doing, particularly when it is accompanied by an

ignorance which leaves young people without protection against the love of excitement and reckless adventure. All these are elements of good manners and right habits which should be universally taught in the schools of a democracy to promote morality as well as courtesy. Some of them, but rarely all, are taught in many good homes; but for the great mass of the people the public schools should inculcate them by direct teaching, and by the indirect influence of good example. To a high degree, good manners spring from and express good morals. Such instruction would naturally be associated with the teaching of natural history and general hygiene.

Finally, all young people should have been taught in home, school, and Sunday school, before they are liable to fall into sexual sins, that chastity in men is just as necessary as chastity in women for the security, honor, and happiness of family life, that continence is absolutely healthy for both sexes, that men's profligacy is the cause or source of women's prostitution with all its awful consequences to the guilty parties and to the innocent human beings who are later infected by the guilty, and that the most precious joys and most durable satisfactions of life are put at a fearful risk by sexual immorality. Does anyone protest that this educational process will abolish innocence in young manhood and womanhood, and make matter of common talk the tenderest and most intimate concerns in human life, let him consider that virtue, not innocence, is manifestly God's object and end for humanity, and that the only alternative for education in sex-hygiene is the prolongation of the present awful wrongs and woes in the very vitals of civilization.

VITAL RESULTS OBTAINED IN A KINDERGARTEN FROM ONE YEAR'S WORK IN THE OPEN AIR.

WILLIAM E. WATT, A. M., PH. D., PRINCIPAL GRAHAM SCHOOL, CHICAGO, ILL.

The term "open air" requires definition because there are now four kinds. In the Graham school are at least three varieties of open-air work as well as the important feature of humidifying and lowering the temperature of the closed rooms, and results vary with the degree of cold maintained, the degree of purity of the air, and the amount of bodily activity provided for in the course.

The first meaning of open air which suggests itself to the average mind is a place where the air is freely admitted to the school without any warming or humidifying, and the pupils are bundled up in Eskimo fashion and supplied with food and foot-

warmers. This may mean a rather expensive form of school and is not the form of open air work which is to be found at the Graham school either in the kindergarten or in the eight grades above it.

Our kindergarten is one in which there is not a penny expended for materials not found in the ordinary kindergarten except that a benevolent woman has supplied each child for some months with a two-ounce bottle of sterilized milk daily. The clothing worn is that which a child ordinarily wears in attending school. During sessions the children do not lay aside their wraps unless they find the room too warm for comfort. There is more bodily activity in our kindergarten than in others, and the circulation induced and the vitality secured cause the room to seem warm to the children when to an adult unused to open air it would seem chilly.

Little children generate much more heat than adults, and one of the results of our work in open air is the conviction that parents and kindergartners generally are mistaken in their ideas of the amount of wraps a little child needs and the temperature the room should have in which he is housed and taught.

Experiments With Temperature Under 40 Degrees.

During the year we have permitted the temperature at times to fall below 40 degrees with a result truly surprising to those who have not seen open air work done in cold weather. For a time we believed a temperature running down to 40 degrees should be maintained whenever the weather would permit, that is; when the outside temperature was low enough to secure 40 degees.

But when I discovered that the kindergartners had procured for themselves felt slippers to protect their own feet on the cold floor, it occurred to me that as the children brought nothing extra, although they were younger and were producing more heat, it would look better to have the teachers dressed in no different costume from ordinary, and so the temperature was raised to between 50 degrees and 52 degrees. This is the temperature now maintained in cold weather. Although the kindergartners preferred to have the colder room and the children seemed to like 40 degrees better than 50, we are keeping the temperature at 50 to 52 degrees unless the weather forces it higher.

We tried lower temperature than 40 degrees with good results. Fearing the children might be enthusiastic or careless and not report when they were chilly or when their toes were cold, unusual care was taken by the teachers to make sure that none suffered in the cold. It is the belief of the two kindergartners in charge of the room that there is no danger on this score, for the children tell them freely when they are chilly or have cold feet, although the occasions are rare.

A temperature of 32 degrees was maintained for awhile several times, the children positively enjoying the experiments and none suffering any discomfort. This temperature was not maintained for a full day at any time, but only for a short time as an experiment, the understanding being that the room should be warmed at once if desired and individuals might run into the warm corridor at any time, a privilege very few, I believe six, took once only.

Animal Heat Helps Ventilation.

Animal heat is a factor in ventilation, especially in a room filled with children of kindergarten age. One of the most valuable results of our procedure is the discovery of a use for this heat in moving the vitiated air out of the breathing zone and letting pure air into that zone. Little children produce much more warmth than older persons. They dislike to be bundled up and wish to let nature have an opportunity to meet the conditions of natural air. They do not like a warm room after they have had some experience in a cool one with vital air.

There is a good reason why every well young child desires so strongly to get out into the cold, to expose himself until his mother is frightened, and to revel in winds which cut his skin keenly and set his peripheral circulation into vigorous action. From observation of our kindergarten I am convinced it is healthful and invigorating for a child to expose himself more than is ordinarily permitted, a reasonable amount of caution being used, of course.

As the body naturally produces more warmth when exercised in open air, it is unnatural to have the exercise performed in warm, close air. It is also unnatural to prevent exercise by bundling the child up too much or by keeping him in a room so warm that he is disinclined to exercise. I do not think the power of producing warmth is easily atrophied, but I know it is materially weakened in persons who year after year close the body away from outdoor air and keep it "protected" from any approach to inclemency.

In the cold room expired air and excrementitious gases rise directly and are crowded out of the windows at the top of the room by pure cold air entering it. This keeps the breathing zone pure, a thing distinctly new. Absolutely pure air in the breathing zone is had not only in the kindergarten but in many other rooms where we have discontinued plenum.

Where The Vitiated Air Goes.

Expired air has a high temperature. It is laden with carbon dioxide which is fifty per cent heavier than air at the same tem-

perature. But there is but four per cent of carbon dioxide in expired air. This does not weigh it down to any great extent. In fact, expired air at a temperature of over 90 degrees when set free in air under 65 degrees is sure to rise. The colder the air in the room the more quickly will expired air rise to the ceiling. Consequently, if we had no other motive than to provide pure air in the breathing zone, we should put the temperature of our schoolrooms down to the freezing point.

Now let us consider what happens in air at the high temperature usual in kindergartens. Expired air at something over 90 degrees thrown into the kindergarten where the air at the breathing zone is 70 degrees or more, has little tendency to rise. It is slightly weighted down with carbon dioxide and its temperature is not much different from that of the room. Furthermore, in the upper part of a room heated to 70 degrees or more the air is usually much warmer still; I have found 90 degrees in the upper part of such a room.

Carbon dioxide will not rise in such air. It will float about or fall to the floor. Its first action is to rise slightly a few inches in front of the pupil and then gravitate back into the breathing zone carrying foul air with it, where it is breathed by some other pupil, sent up slightly, and then it falls to the nostrils of a third pupil. Consequently, in the warm dry kindergarten disease germs in any one pair of lungs are imparted to every other pair of lungs in the room. This accounts for the absence from the ordinary kindergarten of a large part of the membership in the cold months when the hot, dry conditions of the room militate against the health of the pupils. By rebreathing the air, diseases are spread so effectively that no child at an age when he is particularly susceptible can escape having colds and some of the children's diseases. They are called children's diseases, not because they are peculiar to children, but because children under seven years of age are so low in their power of resistance that they are usually afflicted with some of these ills. Adults with low resisting powers contract "children's diseases" readily. Witness the red Indian in his struggles with the measles. Weakened by housing which is deadly to the red man, he falls an easy prey to this simple disease, and deaths from measles are very common among adult Indians who are trying to imitate the white man's vicious way of housing himself.

We keep our kindergarten cool because we are able to separate the vitiated air from the pure humidified air without difficulty and keep the breathing zone absolutely pure all the time. I say this with deliberation: We keep the air in the breathing zone of our kindergarten pure. I am aware of the belief that there is no housing which affords pure air to its occupants, but I wish to announce that we have discovered a different form of housing

and are applying it to education all along the line from the kindergarten to the high school. Furthermore, the largest private military academy in the country, over which I have charge of the ventilation, is applying pure air in the breathing zone for all students up to the time of graduation as second lieutenant in the United States army or entrance at the university with advanced standing. Four universities are now in communication with me with a view of applying it within their walls. The only obstacle to the installation of pure air in all these universities is their doubt that pure humidified air can be given to the breathing zone. The truth is it may be had in any sort of building by the application of the principles exemplified in the kindergarten and other rooms of the Graham school.

As to Stature.

The stature of the pupils who have been permitted to breathe natural air in school during the past year has made an interesting advance. This was reported to me by my first grade teachers who are working in pure air and have pupils who were in cold-air kindergarten last year. I regret I have been too busy to gather accurate data regarding this, as the matter forced itself upon my attention only this week. I am simply reporting the words of two open-air teachers in first grade when I state that there is a gratifying increase in stature in pupils who have had this advantage during the past year. The pupils are not becoming giants, as far as we are able to judge; but they have grown unusually well.

From the first grade we gather data which throw light on what has been done in the open-air kindergarten in the past year. The young son of a physician entered the first grade fresh-air room because it was not considered safe for him to attend a regular school. He was to have been sent to the country for a year at his grandparents' farm, but instead the fresh-air work was chosen. He is one of the most remarkably robust youngsters in the city to-day, and his father, Dr. Hagey, attributes his vitality to the fresh air work.

Miss Alice O'Donnell reports of a class of children who graduated from the cold-air kindergarten into her cold first grade room. One said:

"Miss O'Donnell, look! everybody has two big rosy apples for cheeks."

"Yes, I wonder what made them."

A little chap spoke up, "The cold air."

"One mother" says Miss O'Donnell, "who wished her little girl to receive the same benefits her little brother got last year, had her placed in a cold-air room. She said the child could not sleep at night, and was very nervous. The mother now says the

child is gaining in every respect and attributes it entirely to the fresh air of the school. Furthermore, the child was very shy and appeared afraid of the other children, although larger than most of them, and did not like to take part in any of our games or in any of the work. Now she is often among the volunteers for special 'stunts' and very anxious to do her part. Another's parents decided to take her to California because in past years she has had pneumonia. She entered the open air room temporarily but has been in school all winter, is much stronger than ever, and has had no ill effects."

We have had no bad results from the cold air. The worst difficulty was experienced just before Christmas when celebrating. A child's grandmother attended and got cold feet. We judge cold air is a little severe on grandmothers who merely sit and do not get into the games.

Expert Testimony.

Dr. J. MacDonald, Jr., editor *American Journal of Surgery,* New York, inspected the Graham school last month and said, "I find evidences of more good red blood in this kindergarten than in any other kindergarten I have ever seen."

Dr. Woods Hutchinson has twice visited us and speaks with enthusiasm of the fresh air results.

Miss Henrietta Roos, one of our kindergartners, says: "The children are much more alert than ordinarily housed kindergarten children. They learn songs in a week which used to take three in warm, dry air. Their hand work goes quicker. They do not need nearly as much direction. At first I thought it an unusually bright set of pupils, but find the new ones this year work better, or as well, as those in open air last year." Of the attendance she reports that in cold weather when the ordinary kindergarten is depleted by illness and fear of cold but six or eight of the cold-air children are absent on the average. More children are probably in attendance there this cold morning than in any other kindergarten in Chicago.

Our school physician gave me the following report on the day I left the city:

February 1, 1911.

To Principal W. E. Watt:

At your request I have examined the morning kindergarten class of your school. The membership rolls show forty-eight pupils of whom forty-two were present. I was impressed by the absence of colds and snuffles; not finding a single case in forty-two is remarkable at this season of the year. The color of the children is good. Miss Roos and Miss Hiller informed me that during the months of December and January the number of absent for all causes did not exceed six or eight at any time. The problem of avoiding contagion, which is the

bane of early school life, is perhaps best solved by the maintenance of cold-air rooms. The temperature of your room was fifty-two degrees and is approximately this at all times. Yours,

DUNCAN B. MCEACHERN,
Medical School Inspector.

The superintendent of the Culver Military Academy with several of his officers visited us and induced me to visit his schools and correct the ventilation. He has an infant school for the children of the officers, and reports great improvement in all departments where open-air work is installed although it is less than a month on trial. He reports that the "Christmas coughing and sneezing" which afflicted forty or fifty men when I arrived there are rapidly passing away—between 50 and 75 per cent cured. He says, "I think it will be especially interesting to compare next winter with this, since we shall have the system in use then immediately after the cadets return after their Christmas vacation, which is the time when the colds are more prevalent."

Mr. Dwight Heald Perkins, formerly architect for the Chicago board of education, returned last Monday from a tour of the East inspecting the best recent construction. He came that day to the Graham school. He said: "This is the best air I have ever found in school. I want you in consultation for all my work. Can you go over the finished plans for the Cadillac high school and give me an estimate to-day of changes we must make? Can you come to my house to dine this evening and show me how to humidify and correct my own ventilation? My child suffers with colds all winter and here you have over 1300 free from colds!"

Everyone who has seen the Graham school and its kindergarten is enthusiastic over the physical and mental condition of teachers and pupils who finish their day's work unwearied.

Radio Energy Rivals Oxygen.

A year ago I earnestly asked the members of this society to tell me the reason that pupils in open rooms improve physically so rapidly. I thought it could not be due entirely to the better air. The best reply I received was that window glass shuts out the ultra violet rays of light which have much to do with vitality. At the time I was asking this question Professor Rutherford of McGill University was declaring in another convention that the action of radium emanations in the atmosphere must have a profound physiological effect the data of which we are entirely ignorant of at the present time.

I think he had my answer and I the facts he was wishing for. The new science which Mme. Curie has given to the world seems

to prove that the air is animated with supremely fine oscillations which come from the escape of emanations of radium from the earth. The gases which compose the atmosphere are ionized by these emanations. When such air is breathed we find it is a great stimulant to healthy activity and resistance to disease.

The physiological effects of radioactivity and the X-ray are practically the same, as are also those of the ultra violet rays. Now in our fresh-air kindergartens and fresh-air rooms of the Graham school we are applying radioactivity in the very place where other schools apply dead air with fatal or crippling results.

We are giving our pupils a safe wireless X-ray treatment from within. This stimulates the tissues and weakens the bacteria.

Air that is heated loses its radioactivity. Air that is perfectly correct in its component parts may be dead, devitalized, and unable to afford vital energy. We can live in it, but at a poor dying rate. I attribute the splendid physical and mental condition of our open-air pupils more to the beneficent energizing of radioactive air than to the purity of the air in our open rooms.

Contagious diseases have not troubled the kindergarten this year, although we have had epidemics of measles, diphtheria, and scarlet fever in the neighborhood, and the families of our kindergarten children have been visited with sickness of these kinds in two or three instances. But the children who have had the benefits of open air with its radioactivity—one hundred forty-three different individuals between four and six years of age—have been apparently immune to children's diseases. Perhaps they have been simply fortunate in escaping; but, if so, it is a remarkable escape. Perhaps it is the increased amount of oxygen which has kept them well. But it is my belief, founded on what these children, and older ones, have shown, that it is the added oxygen, the stimulus of cold upon the skin promoting peripheral circulation, and the action of radioactivity in the lungs ionizing the blood, all combined, which has effected such happy results. And my belief is that the third factor is greater than most persons will be inclined to believe without observing the work for months.

AN INQUIRY INTO THE PROBLEM OF DESKS FOR SCHOOL CHILDREN.

WILLIAM A. STECHER, DIRECTOR PHYSICAL EDUCATION, PUBLIC SCHOOLS, PHILADELPHIA, PA.

During the month of April of last year my assistants undertook the measurement of a large number of pupils in the public schools of Philadelphia, in order to secure definite information

so that it would be possible to improve one of the schoolroom conditions that is detrimental to the physical well-being of pupils. I refer to improper seating. Daily observation showed that many pupils were seated in desks either too large or too small for them. Beside adversely affecting the physical health of the pupils, improper seating directly produces restlessness and inattention, which in turn increase the difficulties of teaching.

An investigation conducted in 1908 showed that there were 13,922 pupils, i.e. nine per cent of the total number enrolled in the Philadelphia schools whose desks were too large for them. An inquiry into the causes of this improper seating showed that there were a number of contributing factors. One of the facts brought out was that there seemed to be no standard, based upon accurate measurements, by which a principal or superintendent, who, for instance, wanted to equip a classroom with desks suitable for a 5A class, could order desks and be reasonably certain that the desks would fit the 5A pupils. What was lacking was a table showing the sizes of pupils in every grade and the percentage of different sized desks needed for each grade.

In the following table No. 1, a schedule is presented showing the different sizes of desks and seats, with the memoranda for the benefit of a principal who wants to order school furniture. The figures presented are taken from the catalogues of different manufacturers of school furniture. In order not to present too many sizes and measurements the six sizes and numbers used in Philadelphia and in most large cities have been taken. When a manufacturer's numbers differed (as some begin by numbering the smallest desks No. 1) they were transposed to conform to the Philadelphia usage.

TABLE No. 1.

SCHOOL FURNITURE AS LISTED IN THE CATALOGUES OF DIFFERENT MANUFACTURERS.

Desk.	Age of Pupils.	Suited for the Following Grades.	Height of Seat in Inches.	Height of Desk in Inches.
No. 6	4 to 6	Second Primary Grade, also Extra Primary.	11 and 11⅝	20¾, 21 and 21¼
No. 5	7 to 9	Fourth Primary Grade, also Primary.	12¼ and 12½	22¼, 22½ and 23
No. 4	10 to 13	Second Intermediate Grade, also Secondary.	13¾ and 13½	24, 24½ and 24¾
No. 3	13 to 16	Fourth Intermediate Grade, also Intermediate.	14¼ and 14¾	25⅝, 26 and 26½
No. 2	17 to 20	Second Grammar Grade, also Grammar.	16 and 16⅛	27¼, 27¾ and 28¼
No. 1	Adults	Normal Schools and High Schools.	17⅛ and 17¼	29¼, 29¾ and 30

It can readily be seen that a principal looking for desks for his "Five A" pupils would get little definite information from the above table. With a view to furnishing this information, ten of

my assistants undertook a series of measurements covering grades one to eight, both A and B grades. When the results of the first measurements were compiled and discussed it was found that while we had the sitting height, or rather, the correct height, the seat should have, we could not show accurately what height of desk should go with this. A second measurement was, therefore, taken. Guided by the experience of the first undertaking, the results of the second, more accurate, measurements of five thousand pupils are presented below.

The measurements sought were (1) the length of the leg. This was secured by seating the pupil upon a flat-top table. A book was then held under the foot of the child and the measurement of the leg was taken from the sole of the foot (i.e from the top of the book) to the underside of the thigh (i.e. to the top of the table). Then, (2) the height of the elbow was measured from the book to the underside of the horizontal forearm, the upper arm being held closely to the side of the body. This gave us the two measurements needed, i.e. the greatest height the seat should have and the lowest height the desk should have for each child measured.

Fifty-six hundred seventy-six children were measured, 2981 girls and 2697 boys. The pupils were from grades 1A to 8B inclusive. Every child in each selected school-class was measured. The schools selected were in different sections of the city. The number measured in each grade is shown in table No. 2.

TABLE No. 2.

SHOWING THE NUMBER OF PUPILS MEASURED IN EACH GRADE.

Grade.	Boys.	Girls.	Grade.	Boys.	Girls.
1A	168	143	2A	191	159
1B	187	187	2B	165	174
3A	161	176	4A	167	155
3B	189	186	4B	191	190
5A	179	200	6A	188	228
5B	194	222	6B	189	198
7A	140	194	8A	132	170
7B	108	214	8B	153	181

The measurements taken were in inches and eighths. In grouping the measurements of these pupils the following procedure was adopted. It was decided that only whole inches were to be tabulated. In the leg measurements, the fractions were dropped. The reason for this was that a child with a 16⅝″ leg measurement could comfortably sit on a sixteen-inch seat, but on a seventeen-inch seat its feet would be ⅜″ from the floor. In case of a fraction in the elbow measurement, the number was raised to the next higher whole number. A child who, for instance, measured 25½″ could easily raise his arms upward

½" to a 26" desk, but would be forced to bend forward slightly on a 25" desk.

The next step in the classification was to use the leg measurement as a basis and to see what the elbow measurements of these pupils were, and in which grade those were who had the same leg measurement.

The following table No. 3 shows the pupils grouped according to the leg measurements, showing their sex and their school grades:

TABLE No. 3.

Leg Meas.	Boys.	Girls.	Grades.
9 inches	2	3	1A
10 "	37	21	1A to 2A
11 "	162	142	1A to 4A
12 "	248	280	1A to 6A
13 "	365	346	1A to 8A
14 "	370	413	1A to 8B
15 "	450	498	1A to 8B
16 "	480	560	2B to 8B
17 "	323	421	2B to 8B
18 "	175	232	3B to 8B
19 "	61	54	4A to 8B
20 "	21	8	6A to 8B
21 "	3	2	7A to 8B
22 "	0	1	8B

In order to show the great difference in leg and elbow height among the pupils of any one particular grade, the following table No. 4 is submitted showing the conditions in the 5A grades. Other grades show the same great difference.

TABLE No. 4.

Height in Inches. Leg.	Elbow.	Boys.	Girls.
12	19	0	1
	20	1	1
	21	0	0
	22	0	1
13	20	21	3
	21	3	3
	22	2	2
	23	1	2
14	19	2	0
	20	3	4
	21	3	8
	22	14	9
	23	7	12
	24	2	4
	25	1	2
15	21	2	4
	22	7	9
	23	14	13
	24	9	16
	25	7	5
	26	3	3

Height in Inches. Leg.	Elbow.	Boys.	Girls.
16	21	0	1
	22	2	2
	23	15	13
	24	16	15
	25	15	12
	26	6	7
	27	2	23
	28	3	0
17	23	0	1
	24	3	8
	25	6	12
	26	7	5
	27	1	2
	28	3	4
	29	2	1
	30	0	1
18	25	3	0
	26	3	3
	27	3	4
	28	1	2
	29	1	1
	30	2	0
19	28	0	1

This table shows that in the fifth grades we have children whose leg lengths, when the children are seated, vary from 12 to 19 inches. Then, taking any one of the leg lengths as a basis, we see that with children demanding a seat of the same height, the correct desk height should vary from four to eight inches. Variations of this range occur in practically all grades.

The natural inference to be drawn from these figures would be that all desks in a room ought to be adjustable. It can be stated, however, that as a rule the adjustable desks after they have once been adjusted are seldom thereafter changed to meet the needs of the next child. With the prevailing tendency to extend the departmental work this will be increasingly so, as no one can tell the size of the child who will occupy a particular desk at any time during the day.

Then, again, the average adjustable desk cannot be adjusted quickly enough; a mechanic usually is needed to change the desk. The result is that in most cases the desks are not adjusted properly. As a fact, I know that in a school equipped throughout with adjustable desks, at a former investigation the feet of more than 50 per cent of the children did not touch the floor. From reliable information received during several years I have good reason to believe that this same condition prevails in most cities. It can be stated, therefore, that the present adjustable desk does not meet the situation. What is needed is a desk and seat that by the child itself can at once be adjusted to its immediate needs. There is a great field ready for a desk of this type.

We have several hundred thousand desks in use in Philadelphia, and the problem was how to use these to fit our needs. Our question, therefore, resolved itself into an inquiry that would tell us what sizes of desks were needed for the children in every one of the sixteen half grades in our elementary schools. As it is at present practically impossible to get a desk to fit each individual child, and as the children are continually growing taller, we decided to see if it were possible to select three sizes of non-adjustable desks to fit the greatest number of pupils in each room, and then find what percentage of adjustable desks were needed to take care of those who were either above or below the three sizes selected for each grade.

In arranging these percentage groups, the procedure already outlined above was followed; i.e., the dropping of fractions, thus putting a greater number of children into a group that could use a desk and seat as now supplied by the different manufacturers of school furniture, and already in use in our schools. This plan worked out well, and the following table, No. 5, is presented, showing what percentage of stationary and adjustable desks should go into each half grade.

TABLE No. 5.

PERCENTAGE OF DESK SIZES FOR EACH HALF GRADE.

Number of Desk.	1A	1B	2A	2B	3A	3B	4A	4B	5A	5B	6A	6B	7A	7B	8A	8B	Measurements in Inches.	
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	Leg.	Elbow.
No. 6	31	14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	18
No. 5	47	40	33	20	..	..	..	..	..	..	..	..	..	..	..	..	11	19
No. 4	12	33	40	44	41	26	22	11	..	..	..	..	..	..	..	..	12	21
No. 3	..	..	14	18	37	48	47	26	40	38	33	27	21	15	12	8	14	23
No 2	..	..	..	..	8	13	16	25	42	48	45	51	54	54	57	51	16	25
No. 1	..	..	..	..	..	..	..	..	7	7	11	14	16	20	16	27	18	27
Adjust	10	13	13	18	14	13	15	8	11	7	17	8	9	10	15	14		

TABLE No. 6.

SHOWS THE PERCENTAGE OF DESK SIZES FOR EACH FULL GRADE.

Number of Desk.	1st Grade	2d Grade	3d Grade	4th Grade	5th Grade	6th Grade	7th Grade	8th Grade	Measurement in Inches.	
	%	%	%	%	%	%	%	%	Leg.	Elbow.
No. 6	22.5	....	....	....	....	....	....	....	10	18
No. 5	43.5	26.5	....	....	....	....	....	....	11	19
No. 4	22.5	42	33.5	16.5	....	....	....	....	12	21
No. 3	....	16	42.5	51.5	39	30	18	10	14	23
No. 2	....	....	10.5	20.5	45	48	54	54	16	25
No. 1	....	....	....	....	7	12.5	18.5	21.5	18	27
Adjust	11.5	15.5	13.5	11.5	9	12.5	9.5	14.5		

The figures in the foregoing tables are the averages of measurements taken in all parts of the city. In sections of the city inhabited by people of more than ordinary means the measurements taken were slightly higher than those in the tables, while the reverse is true in sections inhabited by the poorer classes. In preparing for the seating of a school the adjustment necessitated by the location of a school can, therefore, easily be made by slightly raising or decreasing the percentage given above.

Based upon the foregoing it is recommended:

1. That wherever practicable the present seating be rearranged according to the above tables.

2. That where a rearrangement is impracticable and where the seats are too high, temporary footrests be furnished to all whose feet (heels and toes) when the pupils are sitting back in their seats, do not reach the floor.

3. That where the desks are too high the pupils be allowed to sit on straw mats or cushions of sufficient thickness.

4. That where the seats and desks are too low, these be placed upon narrow strips of wood of sufficient thickness to give them the required height. (These strips to be screwed to the floor and to be no longer than the depth of the desk or seat.)

5. That for future use new desks and seats be sought having the following features:

(a) Six sizes as determined by the foregoing tables.
(b) Quick adjustability in height, or, if not of the adjustable type, with a footrest which can be used when the pupil sits back in the seat.
(c) The bench to support the small of the back, if possible by an adjustable back rest.
(d) For the upper grades a desk top of greater depth, as many poor positions in writing and drawing are the result of cramped space.

6. As a preventive measure children should frequently be made to rise from their seats for recitations so as temporarily to relieve any abnormal strain upon the musculature.

In addition to this, great stress should continually be placed upon such physical training exercises as strengthen the muscles of the back.

Papers Presented Thursday Afternoon, February 2.

SCHOOL INSPECTION IN SMALL TOWNS.

ARTHUR TRACY CABOT, A. M., M. D., BOSTON, MASS.

The thesis I shall advance and discuss in this paper is that the best school inspection and supervision in towns and small communities is obtainable by a nurse alone and I shall support this position by citing the experience gained in a two years' trial of this sort of inspection.

The Massachusetts laws provide that "The school committee of every city and town shall appoint one or more school physicians, shall assign one to each public school within its city or town, and shall provide them with all proper facilities for the performance of their duties as prescribed in this act."

The methods by which this act shall be carried out are further prescribed by statute, and finally it is ordered that "The expense which a city or town may incur by virtue of the authority herein vested in the school committee or board of health, as the case may be, shall not exceed the amount appropriated for that purpose in cities by the city council and in towns by a town meeting. The appropriation shall precede any expenditure or any indebtedness which may be incurred under this act."

The next year the last clause in regard to the appropriation of money was revoked, but this had little result in increasing the effectiveness of the act; for a city or town not interested in this sort of work and not appropriating sufficient money is practically not called to account.

Fortunately in the larger places there has been enough interest to lead to a pretty general adoption of school inspection which has been carried out in a more or less thorough manner. In the small towns, however, but little real work has been done.

The failure to appropriate sufficient money for proper inspection practically then renders the act inoperative and it is in this way that the school inspection has been totally neglected in many places except so far as it can be carried out by teachers.

A thorough inspection by a competent physician is a rather expensive matter and is beyond the means of many smaller places. Furthermore, it has been found very difficult to obtain thorough inspection by a physician because in small places the physician's close inspection of the children is interfered with by the professional jealousy of the other physicians in the place.

When I say professional jealousy I do not mean to condemn the feeling. The relation of a physician to the families under his care is a close one. It is sanctioned by long usage and it is quite natural that a physician with the greatest public spirit should object to having children whom he regards as under his care inspected and thoroughly examined by a physician appointed by political influence. It is quite evident, too, that a school physician on good terms with his brother practitioners in the town would refrain from examining children in their families because it would be contrary to his instinct to meddle in such a way with another's patients.

The adoption of the plan prescribed by law has been prevented then, 1st, by the expense of inspection by a physician, and 2d, by the disapproval of the medical practitioners.

These difficulties are very real ones, they cannot be ignored or overridden; they must be recognized and avoided in order to bring about a general adoption of school inspection outside of the large cities.

I think that my home town, Canton, Massachusetts, has found a solution for them and a recital of our experience will perhaps be the best way of setting before you the solution to which I refer.

Immediately after the act above alluded to was passed, Canton appropriated $200, to provide for the school inspection and appointed a school physician. The sum was manifestly not enough to pay for a thorough inspection and the school physician contented himself with occasional services to the school committee and but a small part of the appropriation was spent. Accordingly in the following year only $50 was appropriated. You can imagine how little inspection was carried out under such appropriations.

Considering how this situation might be met, it occurred to us that by the appointment of a school nurse we might obtain, at a sum within the means of the town, the whole time of a trained person able to make all the ordinary inspection.

We also saw that a school nurse, directed to refer children who were found to be sick to their own family physician and who should afterwards merely follow them up and see that they went to their doctor, would avoid the danger of exciting the enmity and opposition of the medical men in the town.

We further felt that the school nurse, being able to follow the children to their homes, could carry her teaching of proper hygiene into the families and in this way be a potent factor in improving conditions about the town.

The town of Canton has two school systems—one the public schools, managed and paid for by the town; and the other the

parochial school, at which rather more than a third of the children in town are taught.

The head of this parochial school, Father John J. Farrell, was approached and at once approved of the plan, saying that he would be glad to favor it in every way he could, provided we would also inspect the parochial school. This was of course exactly what we wished and it insured that all of the children of the town would be under trained supervision.

At the town meeting in 1908 this plan was presented to the voters of the town with a request for an appropriation of $500, which sum was appropriated without a dissenting voice.

A trained nurse, interested in this sort of work, was engaged to begin her labors at the commencement of the next school year and the manner in which she carried out the plan was so satisfactory that at the next town meeting the sum of $950 was appropriated to cover the work of the next school year.

This plan has now been in operation for two years and it is the opinion of those who have watched the work that we have a thoroughly efficient system of inspection and supervision.

The nurse looks after 900 children, examines them at the beginning of the year and records the results in a card catalogue.

She afterwards keeps a record of any illness they may have and seeks in this way to have a complete medical history of all of the children in town.

Such children as show any infirmity of eyes, ears, throat or general condition are referred to their physicians and are afterwards followed up to see that they get advice and follow it. Such children as need attention of a specialist and are unable to pay for it are taken by her to a public clinic in Boston.

In addition to this care of the children's health she has also given talks on matters of hygiene in the schools and her visits to the homes give her opportunities to illustrate and enforce this teaching.

Many of the children were found to have bad teeth.

A public lecture was given in the town upon the proper care of the mouth and the nurse followed this up by talks to the children in the schools.

Arrangements have been made with the dentists in the town that on certain afternoons of the week they give dental treatment to poor children needing it at half price.

In the first year we had almost no contagious disease to contend with. One case of diphtheria was found and quickly isolated. No further cases appeared.

At the beginning of this school year there were five cases of diphtheria in town which had appeared during vacation, all confined to one locality. After the opening of school seven more

cases appeared, all coming from the same part of the town and pupils in the two schools which cared for that section.

As each child fell sick the schoolroom in which he had been was fumigated and the children having adjoining desks were given prophylactic treatment with antitoxin. There has been no evidence that the disease has been given by one child to another in the school and there has been no spread of the disease to other sections of the town.

The coöperation of the board of health which achieved this control of what threatened to be an epidemic was most satisfactory and the school attendance served as a means of keeping a close watch of the children and worked to bring about a limitation of the disease rather than to spread it.

Carried out in practice, then, we have found the work of the school nurse thoroughly satisfactory in giving the town what seems adequate inspection and control of contagious disease. The nurse has also had time to follow up such cases of tuberculosis as were known to the Anti-Tuberculosis Committee of the Nursing Association. The nurse has found in the schools ten cases of children already tuberculous and eighteen cases of ill-nourished and anæmic children who seem liable to be affected with tuberculosis. Plans are being discussed for providing an outdoor room for the use of such children.

I have given this somewhat detailed account of how this plan was accepted by the town of Canton in order to show the attitude of the townspeople toward school inspection. They showed themselves ready and eager to accept it the moment it was presented to them in a serviceable and inexpensive form.

This result was largely due to their confidence in their school committee and their local board of health, both of which bodies favored the project.

Within the first year of this experiment I was consulted by the superintendent of schools in the neighboring town of Norwood and they soon after installed a school nurse. The town of Milton on the other side of us is now planning a similar arrangement.

It seems then that the people in the country districts are ready for this important step in prevention of disease and it only needs a little encouragement on the part of influential people interested in public health to bring about the adoption of a method of school inspection which our experience shows to be effective and economical.

EVIDENCES THAT THE SCHOOL NURSE PAYS.

S. W. NEWMAYER, M. D., IN CHARGE CHILD HYGIENE, DEPARTMENT OF PUBLIC HEALTH AND CHARITIES, PHILADELPHIA, PA.

When the secretary of this Association assigned to me this subject, my first thought was, "How ridiculous to be asked to furnish proof of a self-evident fundamental fact." One may as reasonably ask, "Should public schools exist?" Eight years' intimate association with the work of school nurses had made to me schools, medical inspection and school nurses synonymous. I considered them the tripod of education. When I began to gather information to furnish you with a voluminous and convincing statistical report, I was reminded of Emerson's trite expression, "If you are struck by lightning, don't say anything about it." From the difficulty in obtaining reports about school nurses, one would surmise that the cities having them have been struck by lightning. They have been so stunned by the excellent results that they are speechless, or another case of exploiting our shortcomings but not our success. Few cities can give one a correct statistical report on anything pertaining to the physical condition of the pupils, because the systems of keeping the records are faulty. I believe, however, I can furnish sufficient convincing evidences in favor of school nurses, so that you will agree with me that if medical inspection with nurses were placed on a scale counterbalanced by medical inspection only, the nurses' end would come down so hard that it would go through the floor.

To consider whether school nurses pay, we can consider it from the side of economy and from increased efficiency. One-fifth of the entire population of the United States is enrolled in the public schools. Salaries paid teachers are more than two hundred millions of dollars. The total expenditures for public education require a taxation of thirty cents on every one hundred dollars of valuation on all taxable property. Seven tenths of this taxation for schools is local taxes, a burden which the people place upon themselves, and the most cheerfully paid tax of any. This is a strong presumptive evidence that the citizens are interested in the education of the child. Fourteen cities alone expend seventy-five millions. These enormous funds must be managed to yield the greatest possible returns to every child. Can such efficiency exist with a great waste of time from education due to absences caused by avoidable ill health and correctable physical defects? This gives an unestimated financial loss to the taxpayer with a possible longer time necessary for schooling with its consequent loss of earning

capacity. Are these economical and efficient business methods? The trained school nurse, with her follow-up system, prevents absence for minor ailments, lessens the time absent for some of the contagions. She assures the correction of physical defects, thereby increasing efficiency in the schoolroom. She improves and maintains the health of the children by her practical teachings on hygiene. Her teachings are not confined to the school but extend to the homes. She studies home conditions and removes that from its environment which is apt to lower vitality.

The need and value of school nurses is clearly shown in a study of the origin of this institution. In hospitals and institutions or at the homes the physician diagnoses the disease and prescribes treatment. When finances permit, the trained nurse is employed to carry out the directions of the physician, and where the nurse can not be had, some member of the family tries to perform these duties. Medical inspectors have similar work outlined at the schools. He diagnoses the diseases and defects, and orders or urges parents to see a physician and have the ailment treated. Indifference and ignorance are stumbling blocks which are not so easily overcome. In most of the cases the instructions go unheeded. In private practice where the parent cannot give the necessary care and attention to the sick, the physician sends the patient to a hospital where trained nurses can supply this deficiency. Logically this condition exists at the schools, and the nurse should be employed to carry each case to a successful termination. This has been the order of events in sixty-five cities in the United States. Medical inspectors were employed and it was found necessary to supplement their work. Eleven cities or 14 per cent of those employing nurses in the schools employed them and no physicians. In many of these cases there were volunteer physicians to aid in the work but the inspection and nursing were chiefly dependent upon the school nurses. I believe this exists for the same reason that we find an occasional attitude of the people towards the medical profession to be a desire to save money or get medical services free. When the doctor hands a patient a prescription, she may look at it and then ask if a mustard plaster would do instead. You ask for physicians or nurses for the schools, and they ask if the teachers will do the same. There is little wonder at such requests, for there is no more versatile, all accomplished profession than that of teacher. She can serve equally as well as a teacher, doctor, nurse, clerk, policeman, minister, mother and even father.

England, which was one of the first countries to look after the physical needs of the school child had nurses before they appointed physicians, a reverse of the development in America.

School nursing can be considered a form of visiting nursing, which originated in England fifty-two years ago. This early use of the nurses may account for this arrangement in England. Not until 1877 did the movement of the visiting nurse reach America, when a New York City Mission sent the first trained nurse into the homes of the poor. Here the work was sporadic until 1905, when it gained considerable headway. The school nurse, representing a new idea in visiting nursing, began in 1887 in Liverpool, when nurses visited daily a few schools for the purpose of attending to the minor injuries and complaints, also going to the homes of those having more serious ailments and urging the parents to obtain the services of a physician. The first school medical officer was appointed in London in 1891. His duties were to examine absentees from school, who failed to furnish a doctor's certificate. In the following year, Dr. Francis Warner first published a full report of the examination of 50,000 school children. The first school nurses were volunteers and not until 1901 did the London school board appoint salaried municipal school nurses with definite duties assigned. They examined for contagious skin diseases and excluded those cases found. She did not treat the cases, and consulted with the school medical officer only occasionally. Later the nurse tested the vision and hearing, and kept a medical register of the physical condition of the pupils. In 1907 a superintendent of nurses was appointed, and recently assistant superintendents.

In America, the first medical inspector of schools, Dr. Moreau Morse, was appointed in New York in 1892. Ten years later in December, 1902, the same city established a corps of school nurses. It was the development of the system of school medical inspection that showed the absolute need for nurses. The physician first devoted time to the detection of contagious diseases and the exclusion of all cases found. Attention was then turned to skin diseases, uncleanliness and physical defects which may interfere with the progress of the child. The list of excludable diseases and the number of victims rapidly climbed up. The major contagious diseases like scarlet fever and diphtheria played no more havoc with the child's education than the minor contagious skin diseases such as impetigo and ringworm. Conjunctivitis was as detrimental as was trachoma. Schools would soon be safe and sound because everything was excluded awaiting treatment. The physician recommended treatment but the results were not forthcoming. Records and reports were plentiful but results were missing. The trained school nurse with her follow-up system was the solution of the problem. She first attended to the minor ailments and gradually added to her list every disease which could be made by her safe enough to keep at school. She visited the homes and urged upon the

parents the necessity of treatment for existing eye, ear, nose and throat defects. She took children to dispensaries and did everything to urge a speedy termination of the case. Her work had broadened and spread so she later replaced some of her home visits by school consultations with the parents. The results of her work were felt immediately. Exclusions became fewer, and the length of time absent, even when necessary, was greatly lessened. Defects were not merely recorded but results obtained. There has been a steady decrease in incapacity and inefficiency due to the existing physical defects. Where conflict and misunderstanding existed between the physician, school and the home, it was replaced by confidence, friendship and appreciation.

Previous to the employment of the school nurses and in those cities still without them, many methods have been employed to compel parents to take some action on the recommendations of the medical inspectors. England tried with little success segregation of the defective children, while in America exclusion and written notices seem to be generally practiced. In England, even with laws making medical inspection compulsory, there was great difficulty in overcoming the parental indifference and neglect. The laws have no sections which require the parent to provide the necessary medical attention. There is a firm realization that the employment of trained nurses accomplishes that which the law fails to do, and yet no country or state makes it mandatory for the schools to employ nurses. Several advise or make it permissible to employ them. About 375 cities in the United States have made some attempt at medical inspection, but one state in this country, Massachusetts, has mandatory laws on the subject. So far these laws have been difficult to enforce in all cases. Few states have any legislation on the physical examination of school children, and these, including New York, have only permissive laws. The proposed new school code for the State of Pennsylvania makes it mandatory for the board of school directors of Philadelphia and Pittsburg to employ medical inspectors, and for all other cities it is permissive to employ them, but in case they do not see fit to do so, the commissioner of health can appoint the county medical inspector to perform such duties. Nurses may be employed by any board of school directors. This new code, as well as the legislation of all other states, makes no provisions compelling the parents to attend to the physical defects found. However, should such laws be enacted, it is questionable whether they would not be declared unconstitutional. Where an efficient system of school nurses has been established the results are equal to what could be expected under possible legislative enactment. History shows us that laws are not the "cure

alls" to all our shortcomings and needs. We should place less faith in the necessity of legal forms and more in practical common sense action. This is not surprising for we know that often persuasion and reasoning succeed in accomplishing things which laws cannot. I am firmly of the opinion that any legislature which will make it mandatory for cities to employ for the schools both physicians and nurses, will save themselves the need of any further legislation on this and many other subjects pertaining to public health.

The following information gathered by the Department of Child Hygiene of The Russell Sage Foundation of New York is as interesting as it is disappointing.

CITIES EMPLOYING SCHOOL NURSES AND NUMBER OF NURSES EMPLOYED.

Division.	Number of Cities Having Nurses.	Number of Nurses.
North Atlantic	39	242
South Atlantic	4	10
South Central	2	2
North Central	21	96
Western	10	21
United States—total	76	371

This seems like a rather disappointing report, but previous to 1907 but eight cities in this country had school nurses, and about two-thirds of those now possessing them have awakened to such needs and established them in the past year. You will note that 78 per cent of these cities and over 91 per cent of the nurses are distributed in northern cities. This is not so strange when you consider that comparatively few of the southern cities have medical inspection.

The true and ultimate objects of medical inspection of schools are the safeguarding the health of the pupils, and improving their physical and mental condition by removing those defects that interfere with the child obtaining a normal education with comfort. Medical inspection without nurses is largely one of records and statistics, while with nurses it means action taken and results obtained. No amount of talk can give more convincing proof of the absolute need of school nurses than the following comparative study of the results obtained by medical inspectors with and without nurses.

RESULTS OBTAINED BY A MEDICAL INSPECTOR AIDED BY SCHOOL NURSE.

School.	Nurse.	Number of Recommendations.	Recommendations Acted Upon.	Recommendations Not Acted Upon.	Percentage Acted Upon.
1	Nurse	324	262	62	80.86
2	Nurse	445	434	11	97.53
3	Nurse	320	282	38	88.12
4	Nurse	264	226	39	85.28
Total	Nurse	1354	1204	150	88.9

RESULTS OBTAINED BY A MEDICAL INSPECTOR WITHOUT SCHOOL NURSE.

School.	Nurse.	Number of Recommendations.	Recommendations Acted Upon.	Recommendations Not Acted Upon.	Percentage Acted Upon.
5	None	283	83	200	29.32
6	None	582	152	430	26.12
7	None	441	94	347	21.31
8	None	474	91	383	19.2
Total	None	1780	420	1360	23.6

CITY OF PHILADELPHIA.

RESULTS OBTAINED BY A MEDICAL INSPECTOR WHEN NOT AIDED BY A NURSE.

Individual Children Reported Upon.		Cases Needing Treatment Reported Upon as Terminated.	Results Reported.			
Number.	Kind.	Number.	Action.		No Action.	
			Number.	Per Cent.	Number.	Per Cent.
751	Defective vision	272	70	25.8	202	74.8
	Hypertrophied tonsils	338	62	18.4	276	81.6
	Adenoids	36	5	13.9	31	86.1
	Defective teeth	152	31	20.4	121	79.6
Totals		798	168	21.1	630	78.9

RESULTS OBTAINED DURING THE SAME PERIOD BY THE SAME MEDICAL INSPECTOR WHEN AIDED BY A SCHOOL NURSE.

Individual Children Reported Upon.		Cases Needing Treatment Reported Upon as Terminated.	Results Reported.			
Number.	Kind.	Number.	Action.		No Action.	
			Number.	Per Cent.	Number.	Per Cent.
704	Defective vision	441	355	80.5	86	19.5
	Hypertrophied tonsils	104	68	65.4	36	34.6
	Adenoids	62	45	72.6	17	27.4
	Defective teeth	150	138	92.0	12	8.0
Totals		757	606	80.0	151	20.0

The following is a report of the work of the school nurses of Philadelphia for the year ending December 31, 1910.

Number schools	39	
Number nurses	9	
Number old cases	42869	
Number new cases	16341	
Number cases cured	10969	
Number visits to schools	5108	
Number of visits to home (old)	3096	
Number of visits to home (new)	1928	
Total number of visits to homes		5024
Number of visits to Dispensary (old)	3139	
Number of visits to Dispensary (new)	2007	
Total number of visits to Dispensary		5146
Number school consultations (Parents)	754	
Number of school consultations (Pupils)	2687	
Total number school consultations		3441
Examinations for uncleanliness	30099	
Number examinations for Bureau of Municipal Research (Special)	737	

DISEASES FOR WHICH PUPILS WERE TREATED—SCHOOL, HOME, AND DISPENSARY.

Diseases.	No. Cases.	No. Cured.	
Defective vision	1656	1217	Glasses, 1028 pairs. No. exam., glasses not req., 189.
Corneal ulcer	4	7	
Conjunctivitis	379	350	
Glass eye		1	
Cataract	....	1	Removed.
Other diseases of eye	296	306	5 operations.
Defective hearing	43	26	
Otorrhea	64	67	
Other diseases of ear	71	55	
Hypertrophied tonsils	768	443	211 operations.
Adenoids	119	80	28 operations.
Defective speech	29	13	
Other diseases of nose and throat	387	491	
Pediculosis	6376	3108	
Eczema	599	578	
Pust. derm	124	109	
Impetigo	193	159	
Ringworm	206	192	
Scabies	69	55	
Wounds	1841	1462	
Other diseases of skin	1315	991	
Scoliosis	5	7	
Hip-joint disease	....	1	
Other orthop. diseases	33	29	1 brace and shoes obtained. 18 sent to gymnasium. 1 operation.
Teeth	828	479	
Malnutrition	142	129	89 sent to country.
Nervous	30	22	1 sent to epileptic hospital. 2 sent to country. 1 sent to Spring City. 2 old cases admitted to Oakbourne Home.
Mentally deficient	2	....	
Tuberculosis (2 Sus. T.)	4	1	Sent to country.
Trachoma	52	49	
Miscellaneous	706	541	
Total	16341	10969	

The school nurse has opened a path to the development of an ideal system of betterment of public health in our cities. The school nurse of the future will be the municipal nurse, whose duties will include not only protecting the health of the school children, but also caring for infants, teaching mothers their hygiene and proper feeding, thereby reducing this great and unnecessary mortality. By improving housing and living conditions she will reduce the mortality from tuberculosis. She will be the supervisor of health and sanitation in the factories, as well as a teacher of hygiene to the children at school and to their parents at home. She will be the connecting link between the destitute family and the numerous organizations dispensing aid. With a small district assigned to a nurse, and she being held responsible for the health of every person and sanitation of every house in that district, results will be obtained which would be impossible by any other system. The school nurses

of the future are destined to be the guardians of our public health.

I desire to express my appreciation for aid rendered in gathering the above statistics, to Russell Sage Foundation, New York; Bureau of Municipal Research, Philadelphia; Miss Anna L. Stanley and Dr. C. A. Groff, Philadelphia.

CONTAGIOUS DISEASES.

A. JACOBI, M. D., LL. D.

I have been directed to speak on "Contagious Diseases, their Relative Communicability, Dissemination, and Prevention," for twenty minutes or less.

In the opinion of the public at large, public and private hygiene and sanitation are the business of somebody who is paid for his job; they believe somebody is paid for this purpose out of the one hundred and seventy millions for which the people of New York City are taxed. A preventable case of typhoid or a preventable case of diphtheria or scarlatina, however, when dead, has its funeral paid for out of a private pocket. The owner does not know better, because it happened to be a case of "providential dispensation."

The knowledge of contagious diseases, these perpetual enemies of the race, should be acquired in different measure by different classes of people. Sanitarians, or what ought to be the same, physicians, should be taught and know all about the nature of a contagious or infectious disease,—its direct or intermediate causes, including its bacteriology, duration of incubation, secondary diseases and their dangers, treatment, etc. Physicians should know more than they ought to teach the second class, viz. the teachers. The teacher should, on his or her part, know more than they are instructed to teach the pupils. These, young or old, should learn by heart and obey simple rules, like those of the ten commandments. These are learned and absorbed directly, and form part of one's moral and civic essence, without any requisite theories on the rights of property, on marriage law, etc. As we have learned to think morally and politically, so we should be imbued with hygienic thinking. In our teaching, however, many of us have the bad habit of wishing to teach too much, partly to be useful, partly to show off our superiority. In our milk stations, for instance, mothers and nurses need not be taught chemistry and enzymes to utilize for the poor baby the simple hygienic methods of artificial feeding.

An early American writer on diphtheria reports as follows in the Illinois State Medical Society of May 18, 1880: "In one school district with fifty-nine pupils, an epidemic of diphtheria was started (no case having previously existed) by two boys who visited a neighboring community where there were cases of the disease. In a few days both boys had symptoms of 'cold,' received some domestic treatment for their trifling fever and sore throat, and soon returned to the school, where other pupils complained of the offensive odor of their breath. Other cases appeared, and the number of persons attacked was fifty-eight. Of these, seventeen died, sacrificed on the altar of ignorance and carelessness. Of the fifty-eight cases, seventeen were nasal diphtheria. Of these seventeen, fifteen died." (N. Y. Med. Record, June 12, 1880.)

In No. 1 of the National Board of Health Bulletins, June 28, 1879, Dr. Elisha Harris reports: "In the fourth school district of the township of Newark (Northern Vermont) amidst the steep hills, where reside a quiet people in comfortable dwellings, the summer term of school opened on the 12th day of May, 1879. Among the twenty-two little children who assembled in the schoolroom in the glen were two who had suffered from a mild attack of diphtheria in April. One of them was, at the time school opened, suffering badly from what appeared to have been a relapse in the form of a diphtheritic eyelid affection. Besides, it was proved that these recently sick pupils had not been well cleansed, one of them having on an unwashed garment that she had worn in all her sickness three weeks previously. At the end of the third day of school, several of the children were complaining of sore throat, headache, and dizziness; and on the fourth day and evening so many were sick in the same way that the teachers and officers announced the school temporarily closed. By the end of the sixth day from school opening, sixteen of the previously twenty-two healthy children became seriously sick with symptoms of malignant diphtheria, and some were already dying."

That diphtheria is contagious, was never denied except by a few cantankerous persons. The contagious element is directly communicated by the patient. It also clings to soiled and semi-soiled substances, and in this way is transmitted even after a long time. It clings tenaciously to dwellings and furniture, particularly when no change of air or sunlight strikes them. It can be transported by the air, though probably not to a great distance; hence, in houses artificially heated, in which the windows and doors are mostly closed, it rises from the lower to the upper stories, and it is for this reason advisable to keep the sick on the top floor. In schools—not in old ones alone,—it is the same. It is certainly transmitted by spoons, glasses,

handkerchiefs, and towels. The contagious character increases directly in proportion to the neglect of proper ventilation. Kissing has always been known to transmit the disease.

In the majority of cases, diphtheria has a preparatory stage of longer or shorter duration—from one to two days to a week or more, in my experience thirteen days and four hours—similar to a common sore throat. The patient feels indisposed, has a slight elevation of temperature—which in all cases should be taken in the rectum, never in the mouth, which is a make-believe procedure—is dejected, complains of pain in swallowing, mainly of fluids, has headache, and sometimes vomiting, though not so frequently as in scarlet fever. Convulsions have been observed, particularly in small children, those of advancing years having chills instead. Temperature rises to 102° and 104°, rarely—as in scarlatina—to 105° and 106°. The differences depend mostly on the surface which is affected, and on the greater or smaller participation of deeper tissues. You have to be careful in your diagnosis, for a common catarrh—so-called cold—of the throat or nose has some symptoms identical with a diphtheritic catarrh. In all of them slight swellings of the glands under the jaws are observed. In diphtheria the reddened mucous membrane of the throat and mouth is covered by grayish tufts, later on by membranes more or less fixed in or lying on the surface. The membrane may be quite small and difficult to observe. When it is on one side only, however, and the mucous membrane is swelled and reddened on one side only the affection is probably not diphtheritic but the result of a local irritation, a wound, caused by a hard body—a bone or something else. The extension of a tuft or a small membrane to one larger is mostly perfected in a day or two. The gravity of the disease does not depend on the size of the membrane; many cases in which it is small are grave. Then the tissue around is swelled, purple and acrid looking, and the fever is higher. The latter depends to a great extent on the rapid absorption, not of the bacteria of diphtheria, "Loeffler bacilli," but on the poisons, s.c. toxins secreted by these bacilli, and on the rapidity of absorption, which depends on the locality in which they have been deposited. This is important to consider, and as the convictions of the medical world are just beginning to be modified, I mean to spend a minute on this discussion before this unusually competent—though lay—forum.

I am certain that all of you have been told time and again that the tonsils are the seat and cause of all possible infectious diseases. It has been taken for granted that diphtheria, scarlatina, tuberculosis, rheumatism—these more than most others—invade the circulation of the lymph and blood through the tonsils. That appeared to be proved when the open canals of the

follicles of which the tonsils are composed were found to contain the microbes of the diseases mentioned. The ducts of these follicles are more or less narrow in the healthy tonsil of the healthy child. At an early age the tonsil is comparatively large; it protrudes beyond the arch of the soft palate on both sides. That is why, when you look into the throat of a healthy child, you notice the protrusion of the tonsils so as to leave only a more or less narrow passageway between them. It is easily perceived that microbes entering the mouth are caught by the protruding prominences. It is only in later life, when the tonsils have shrunk normally or by disease, and are retracted sideways, that this danger becomes less marked. That is one of the reasons why adults are believed not to be easily affected by contagious diseases; another is this: that most acute infectious diseases take place only once in a lifetime, and most adults have acquired immunity by having passed through an attack in early life. Thus, after all, the child's tonsils are accessible to the *entrance* of disease-producing germs. That is why you find in the tonsils the germs of diphtheria, the streptococcus of scarlatina, the germs of tuberculosis, in large quantities. That is also why people concluded that the corresponding diseases have entered the system through the tonsils, and the tonsil has been considered the head devil of all infernal machines. One of the exaggerations of which even my colleagues of the medical profession are not guiltless, is this: that when a tonsil is to be operated upon—and there are those who condemn every one of them—it must be removed in its entirety; it must be *ex*sected, not *re*sected. Some say that is very difficult and nobody can do it well but the very writer; some say it is easy, no matter if the carotid artery is near by and separated only by a flimsy party wall. Still, surely there are the microbes *in* the tonsil. There are two ways more or less open to them to leave. Number one: Until a short time ago the gospel was this—that they marched right into the circulation. They would do it if, or as, the road was believed to be open, *but it is not.* Indeed, the tonsil is embedded in a firm capsule through which the entrance, by few blood vessels and lymphatics, is quite difficult. That is why, when, for instance, in diphtheria, the disease is *confined to the tonsils;* an old—fifty-year old—experience even in America, has taught us that the *neighboring glands* are not at all, or very little, affected—the best proof, as long as no blood vessels are injured and open, that no system infection has taken place. And still, the *throat is the cause,* or may be the cause, why the infectious contagion takes place.

Escape Number two. The microbes which cannot escape, indeed few can escape through the solid capsule, march back or are pushed back into the open throat cavity. In this

cavity they meet with an extensive ring—the so-called Waldeyer ring—composed of many superficial lymph follicles, high up in the throat and nose, every one of them ready absorbents, and therefore every one of them one of the culprits which may admit the element of disease.

Now some of the writers of big books have accused the tonsil alone as being the genuine criminal; others have been so careless as to acknowledge the presence and importance of Waldeyer's lymph ring, but still cling to the synonymity of the two terms. In these matters I want an audience like this to be well informed. It is not always an indifferent matter whether tonsils and real or alleged adenoids are condemned to cutting and scraping. It is never an indifferent matter not to understand things correctly.

In connection with this subject, I shall say to those who are not acquainted with the fact, that every one of you has at this moment a throat full of pneumococci. They are innocent as long as the mucous membrane of your throat and larynx and bronchial tubes is not denuded of its epithelial protective covering—by a cold, for instance; if they are, you have a pneumonia, or rather, the pneumococcus has you. Every one of you has probably, this very moment, his nose covered inside with diphtheria germs, with tuberculosis germs, with scarlatina germs; as long as the mucous membrane is covered with healthy epithelium you are safe. So pay the necessary respects to the health of your nose and the children's noses. A clean nose keeps its owner as vigorous as handsome.

Another instance. Your skin may be covered—is covered all the time—with Fehleisen's coccus. The harmlessness ceases when you scratch your skin, or there is a wound of another kind, and you may die of erysipelas.

Though only a few minutes are mine, I could not help but touch upon these subjects, because in our popular magazines—even the valuable and well-informed ones—you read nothing of them. Besides, you do not know whether your informant in the magazine you take is well or sufficiently informed himself. It is not every one that reaches the pole, though he be what is called a doctor.

I add, in this connection, one subject of great importance to the practicing schoolmaster or schoolmistress, *besides* everybody else. The worst cases of diphtheria are those of the cavities of the nose. There was a time when every case, no matter whether complicated with glandular swelling or not, was considered fatal. The French, who saw a great deal of diphtheria, were convinced of that. That was so indeed, until the system of irrigation was introduced during an attack of nasal diphtheria. This simple life-saving innovation happens to

be American. That is why it took a long time to meet with approval. Atomizers are useful things and profitable to the manufacturer and advertiser—much less so to patients. Injections into the nose should, if possible be avoided, for they may injure the ears through the Eustachian tube. They cannot be avoided, however, in such bad cases as require the forcible removal of clogging membranes. Irrigations of warm watery solutions are made from a Bermingham, Dessar, Whitall Tatum, or other glass cup.

The solutions are those of table salt, 7-1000 (½ teaspoonful in a glass of warm water), or boric acid (2-4:100), or corrosive sublimate, (1:1000-10,000), or, when there is an offensive odor, potassium permanganate, (1:2000-3000). Potassium chlorate should be found in no house except when prescribed by a doctor. Formerly it was a household remedy. You found it on kitchen shelves; it was used for every sort of mouth and throat disorder, both externally and internally, without the doctor; and with or without the doctor killed many persons, young and old—even after an American doctor taught its dangers in 1860, and perhaps with better results in 1876 and 1879.

How often should irrigations into the nose be made during an acute attack of diphtheria or complicated scarlatina? From fifteen to five times during a day; four or five times during a night.

Salt water irrigations should be made once or twice every day into the noses of children, so that the fluid will escape through the mouth, in all cases of chronic catarrhs of the nose and throat, which are very frequent, particularly when the normal asymmetry of the nares is increased by considerable deviation of the bony partition and swelling of the mucous membrane results therefrom. If you like Greek better, you call them hypertrophies. They are frequently complicated with glandular swellings about the neck. In fresh cases of this kind, and frequently in older ones, these glands will diminish and disappear when the soil from which they are infected—that is, the nose and throat—are kept clean by one or two daily washings. In a host of cases operations, such as burning, cutting and sawing, could be avoided if that simple procedure were insisted upon; many adenoids would be prevented from growing large, or from returning after operations, and the microbes leading to tuberculosis, diphtheria, meningitis, poliomyelitis, scarlatina, etc., would be kept from invading the circulation.

Is scarlatina easy to discover?

In some cases unfortunately too easy. Sudden fever, vomiting—the characteristic symptoms—cannot be mistaken. The speckled tongue, the purple throat—with or without membranes, or tufts—are readily recognized, and seldom give rise to mis-

takes. The membranes are usually fibrous deposits, with white —sometimes red—blood cells and epithelia and cocci; sometimes they are really diphtheria and form the bad complication of diphtheria and scarlatina. According to the condition of the nose and throat, the glands of the neck are smaller or larger. These mixed infections are always grave. In the case of school-children the teachers have a great responsibility. They have a readier opportunity to examine every child when it enters the building during an epidemic. The school doctors are frequently not available at an early hour. You say they should be so. So say I. There are not enough of them. I hope they are all of the best material. But they should be paid enough for the best service a medical person can render. The insufficiency of the present service, if it exists—or, rather, as it exists—can, however, not be remedied by the establishment of a special municipal school health department. Such a one has been planned. It would be a grave mistake, in my opinion. In place of one insufficient department, we should happen to have two, and a source of constantly overlapping complaints and collisions. *What is required* is a single health department with ample means furnished by the city, with secured success, with orderly conduct of medical officers supported by the police, and incessant watchfulness directed toward knowledge and efficiency on the part of the doctors, and the support of their superiors. The commissioner need not be a doctor—no harm if he were—but "not in politics"; but he should be aware of what the people expect of him.

I spoke of the teachers. Most of them are not well informed in matters of hygiene, and as specimens of health and vigor too many are themselves failures. I am sorry to say that, but I have observed them these much more than fifty years, and this platform is not reserved tonight for eulogies and mutual compliments. In times of epidemics, every throat of every child should be examined daily. A suspected child should be refused admission until his health is acknowledged to be intact. It is better not to admit a child for a day than to make a mistake in admitting one that proves contagious. But a teacher must not use a finger to touch a child's mouth. That finger may become infected, and if not, that same finger, which surely has not been previously disinfected, gets into the mouth of another child, or many more children, and that teacher becomes a danger. It is direct contact which proves dangerous, and, if not avoided, iniquitous. That point was made by Kerschensteiner of Munich in 1882; by Seibert of New York who insisted upon daily examination in 1869. Mediate contact is just as dangerous. Participation in a gumdrop or candy-stick, and kissing are dangerous practices. The loan of pencils—always licked by every

young one—was suppressed, at least forbidden, by Torek in 1891, in the Workingmen's—now Ethical Culture—School.

So, a good deal has been said, occasionally, by good observers. I have learned in what is called a long life, that what is worthy of being preached once should be preached a thousand times on a thousand platforms. Latinists among you will remember what Cicero said of his Roman fellow citizens *(pro archia poeta 26)*: "They have dull ears." In that respect, we are Romans.

There are some things every teacher should remember. Many children have a sudden skin eruption, exactly like scarlatina, with little or no increase of temperature. It may be the result of so-called autointoxication, that is, of a surface irritation caused by intestinal putrefaction in overfed, badly fed, also starving, children. As scarlet fever may commence the same way, the child should be instantly excluded. It may return the very next day, after the doctor has made a fuller examination—mainly of the throat and the urine—the latter of which contains the clinical proof of putrefying material and "autoinfection." A watchful eye and the consciousness of responsibility are qualities which make a meritorious teacher, and may prevent a fatal epidemic.

There are other symptoms a circumspect teacher need not miss—the almost characteristic itch between the fingers and on the arms, the contagious favus, tinea, on the head, the smallest vesicles of chicken pox, the measles-like spots of German measles, or the bluish-white spots in the mouth of measles children—first discovered by Flynt, a Dane, then most emphatically by our fellow-citizen, Henry Koplik, after whom they have been universally denominated Koplik's spots—that precede the full outbreak of measles by two or three days.

SOME SUGGESTIONS FOR A COURSE OF STUDY IN HYGIENE.

LINNÆUS NEAL HINES, A. B., A. M., SUPERINTENDENT OF SCHOOLS, CRAWFORDSVILLE, INDIANA.

A healthy people is usually a happy people and a happy people is more likely to do its work well than one whose habits encourage disease. More than all other agencies combined, perhaps, the American school is doing the heroic work of teaching our people to be a clean people, and to adopt ways of life that will in every way make us happier, healthier and saner than we have been heretofore. To my own mind the American School

Hygiene Association has a field of vast usefulness if it will but live up to the promises of its ability and to the opportunity that lies before it. If this Association can crystallize all the ambitions and endeavors of those that are working for better physical conditions in our public schools, it will be doing a work that is beyond all estimating. The Association has a vast work to do, not only in blazing the way in the fields of theory but in applying the principles of hygiene to the daily life of all school children no matter whether they be in a little roadside school on the prairies or in the schools in the most congested districts in our greatest cities.

Science has done and is doing a magnificent work in telling us how to live so as to conserve health. There is an almost daily addition to the stores of knowledge. There is pressing in upon the schools a flood of knowledge of hygiene and the rules of physical development. The great problem before the practical school man is to get this mass of scientific information so organized and divided that it can be applied not only to the routine of the schoolroom but to the lives and minds of the pupils so that life-time habits will be formed. With the exception of the moral lessons that the pupil gets from the precepts and example of the upright and gifted teacher, no instruction that the child may receive equals the knowledge of how to keep the body clean and healthy. Life for the child will be happier and more effective in every way if he learns early to take care of the temple in which he lives.

"Hygiene should be an applied study."

"That the ethical and physical sides of our natures act and react on each other is certain."

"I have a strong feeling that we must go behind the schools to the homes, if we are to do anything like all the good which we desire to do."

"We are learning that the methods of attaining sound physical, mental and moral health are all necessary parts of a science of hygiene which transcends the mere laws of sanitation."

"The rising generation should appreciate from childhood the nature of those influences which injure physical and mental health."

"The introduction of pure physiology into the schools is by no means to be desired, but rather the awakening of intelligent interest in those principles of sanitary science which underlie a healthy life. . . . . Knowledge should be converted into conviction and conviction into conduct."

"The laws of health are simple and few; they could be incorporated in a dozen commandments; and the physiology necessary to explain them, and to make their importance appreciated, can adequately be set out in a very short space, and in simple, non-technical language. . . . . Many text-books show (the same) lack of appreciation of the real requirements of the subjects: though labeled 'elementary' and 'practical,' they are neither; and useful facts are smothered up in an abundance of other matter, a knowledge of which has no practical value whatever to the class of readers for which the book is designed."

"The teacher must strive to make pupils realize the importance of the subject, and to arouse in them a living interest in, and a desire to observe, the ideals of healthy, moral, and physical surroundings. The school régime must afford every opportunity for healthy bodily development, not only by training the pupils in suitable physical exercises and in encouraging them in a good selection of games, but also by continually presenting an object lesson of the recognized importance of fresh air, cleanliness, etc. The teacher can do much by example, precept and personal influence to create a sanitary conscience among the rising generation. . . . . To these ends he should enlist as far as possible the coöperation of parents in the home, and he should bring, if possible, his personal influence to bear upon them in certain cases. The training in the observation of sanitary precepts is a form of moral training, and if the home influences are antagonistic to those of the school the home influence will often prevail. A dirty and neglected child indicates the necessity of attempting to do something to improve the parents."

"But you cannot train them (the children) to be hygienic, even in thought, for future needs, since the child lives in the present, and takes no thought for the morrow; give him habits by practice, and he can not shed them."

"The aim in teaching hygiene, especially when associated with the teaching of temperance is moral; it is to lead to right conduct. Now, the child grows in conduct, as in all else, from the exercise of right doing. He will be a sober man if he learns to control his greed in childhood. . . . . The influence of the home and the teacher, the standards set by society, these are the traceable causes which mainly affect the growth of character in our pupils."

"If hygiene is to be primarily a collection of habits in the pupil's nature, he must practice hygiene in the school and the field, for hygienic exercise should be found in the life of the school. That is to say, the school building itself, its ventilation, its dust, its cloak-rooms, its back premises, must be made a matter of hygienic care, first to the teachers, and through them to the pupils."

The foregoing quotations are given in the course of study in hygiene and physiology of the Indianapolis schools. These excerpts are from papers read in 1905 before the meetings of the Royal Sanitary Institute, held in London. They set forth in a reasonable and clear way some of the ideals in the effective teaching of hygiene. Every writer of a sane course of study in this subject must have a clear view of his field, the importance of the work and ends to be attained.

The first great requirement in the teaching of hygiene, as in the teaching of every other subject, is a teacher who is alive to the possibilities of the subject and is filled with enthusiasm for it. If the teacher is sufficiently prepared and enthusiastic, the course of study is of secondary importance and need be nothing much more than a guide for the purpose of keeping the work of a system uniform. If the teacher has only an average interest in the subject, however, it is well to have a course of study as complete and as suggestive as possible. Since a great per cent of teachers have only an average interest, it is well for every school system to have for its use a course of study in hygiene that will carry the teacher along

in spite of himself. However, my first suggestion in regard to a course of study in hygiene is: *See that the teacher is properly prepared and has an enthusiastic interest in the subject.*

The problem of the course-maker is ultimately the problem of the teacher in applying the provisions of the course and knowledge of hygiene to the child. It is not easy to improve on the suggestions of the author of the Indianapolis course, along this line. He sets forth the teacher's problem as follows:

"1. How to interest and inform the minds of the children of the different grades in matters of health.
"2. How to select those phases of life for emphasis at the varying points of development that a natural response in action, that is, in better living, will result.
"3. How to direct the school life, that part of life that is under the teacher's control, in such a way that constantly and consciously it may be training the children in hygienic habits.
"4. How to subordinate physiology to hygiene, but yet to have it form an adequate background or reason for the hygienic law.
"5. How to use the text-book and yet to subordinate its use to observation and discussion.
"6. How to secure home interest and support.
"7. How to relate moral, mental and physical interests that these shall be seen and felt to be governed by common laws of development and control, of activity and temperance.
"8. How to be positive and convincing in instruction, yet liberal and sane, inducing the assent of the child's and parents' reason.
"9. How to inculcate lessons of temperance and sobriety."

The above enumeration is an admirable setting forth of the ideals that ought to prevail in any system of teaching hygiene. These ideals should be kept in mind by the man who writes a course of study. The second suggestion for a course of study in hygiene is: *Make a full, clear, inspiring statement of all the relations and interrelations of the teaching of hygiene, so that the most indifferent teacher will catch something of the spirit and enthusiasm that ought to attend the successful teaching of the subject.*

The child is a citizen of the school and the community. His life is lived in the home, on the schoolgrounds and in the schoolroom. Any properly effective course of study should include his activities in the community, in his home, on the schoolgrounds, in the schoolhouse and in the schoolroom. His whole life should be taken into consideration and the course of study planned accordingly. The course should include not only correct sitting postures at the desk and other hygienic rules relating to life in the school but to all the rest of the child's life as well. Third suggestion: *Contrive a course of study that will be properly suggestive of all of the activities of the child in the school and elsewhere.*

The child needs to have correct hygienic habits from the earliest infancy, so that a proper course of study will be practically as full for the first grade as for the higher grades. Infancy is the habit-forming time. The child should enter an atmosphere of hygienic living the moment he enters school. As much attention should be paid to his welfare the first year he is in school as the last. Too much attention cannot be paid to the forming of correct habits. Fourth suggestion: *The course of study should be complete for every grade of the school course.*

Teaching of hygiene will accomplish little if the surroundings of the child in the schoolroom are unhealthful. The teacher who does not know what those surroundings ought to be or who neglects the proper conditions of her schoolroom ought not to be teaching, but since an inefficient teacher is occasionally found, we make the fifth suggestion: *The course of study should place frequent emphasis on the things that make for good health in the schoolroom.*

Despite the widespread discussions of hygienic subjects and the abundant literature on them, there is yet much ignorance as to what is proper in the way of ventilating schoolrooms and caring for them in other ways. Frequently janitors are poorly informed along these lines or they are careless. Sixth suggestion: *As a part of every course of study in hygiene there should be printed detailed instructions as to the ventilating, lighting, sweeping, dusting and general care of the schoolroom, and the instructions should be so stated that it will be heavily incumbent on every teacher and principal to see that they are carried out.*

It is natural for a child to become tired of the thing of which he hears too much. Instruction in hygiene can become wearisome if it is not handled properly. There should be a variety and an enthusiasm in the instruction that will keep the child's interest alive. He should be shown that the whole thing is worth while. Further, the results of unhealthful ways of living should not be overstated nor understated. The exact truth is what is needed at all times. Seventh suggestion: *The course of study should present its topics in as interesting a way as possible with statements of a variety of ways of treatment, so that disgust for the subject will not arise.*

As a pound of practice is worth a ton of preaching, so the pupil will best learn his lessons in hygiene if he lives the rules of health about which he hears. Sanitary committees of pupils in every schoolroom can be appointed to look after schoolroom conditions and these committees can be so shifted that all the pupils will get the benefits of such activities. Pupils can also be asked to investigate for themselves and make reports on various

questions in hygiene. Eighth suggestion: *Every course of study should abound with suggestions as to what pupils can do to help conditions in the schoolroom and elsewhere as well.*

In addition to the formal course of study various devices can be adopted that will lend interest and effectiveness to the work in hygiene. These devices can be set forth and the teachers can be directed to use them. One of these is the "Student's Health Creed," written by Dr. J. N. Hurty, of the Indiana State Board of Health, and issued for the use of the schools of the state. The creed is printed on a slip of paper. The pupil is asked to sign the creed and paste it in his reader so that the statement of simple rules of health will always be available. The creed follows:

SIGN AND PASTE IN YOUR READER.

Recommended by the Indiana State Board of Health

THE STUDENT'S HEALTH CREED.

I believe my body and good health are sacred. If I am sick it will very probably be because I have violated some one or more of nature's laws of health.

I will study nature's laws of health and will obey them for my own sake.

I will not suck my fingers, or pick my nose or wipe my nose on my hand or sleeve, for these practices are unsanitary and very impolite.

I will not wet my fingers in my mouth when turning the leaves of books.

I will not put pencils in my mouth or wet them with my lips

I will not put pins or money in my mouth.

I will not buy or use chewing gum nor buy and eat cheap candies.

I will use my mouth only for eating good plain food, drinking pure water and milk, and for saying good and kind words.

I will always chew my food thoroughly, and never drink whiskey or wine.

I will strive against the habit of "clearing my throat" because it is nearly always unnecessary, and may be disagreeable to others.

I will not cough or sneeze without turning my face and holding a piece of paper or handkerchief before my mouth. Polite people never cough in public if they can prevent it.

I will keep my face, hands and finger nails as clean as possible.

I will not spit on the floors, stairways or sidewalks, and will try not to spit at all; ladies and gentlemen do not spit.

I will wash my mouth every morning on getting up and at night on going to bed, and will use a tooth brush if I can get one.

I will be clean in body, clean in mind, and avoid all habits that may give offense to others.

I will get all the fresh air I can and will open wide my bedroom windows when I go to bed.

The time must come when every schoolhouse will be equipped with baths and all the appliances necessary for keeping the body clean. Medical inspection and school nursing are taken for granted. It is all very well to talk to children about the beauties

of cleanliness but unless the child has the facilities for keeping himself clean such teaching is likely not to be lasting. The rules of hygiene must become ingrained habits to be of the greatest and most lasting good. Courses of study in hygiene will in time require that every pupil be kept scrupulously clean either by his parents or by the school. There will be no such thing as giving an unclean boy lessons in hygiene and letting him continue in his unclean condition. The school must take up this added duty if its teaching of hygiene is to bear the fullest fruition.

An examination of the courses of study of the large cities of the country reveals a variety of plans of treating hygiene but all of these courses reveal the same general high purposes. The Indianapolis course is a splendid one in almost every way but provides no definite lessons in hygiene in the first two grades. The Cincinnati course is more meager in its introductory matter, but it contains a full course for all the eight grades. The Philadelphia course rather emphasizes physiology from the fifth grade up. The New Orleans schools have a complete course in hygiene for all eight grades. The Chicago schools have a course in physiology and hygiene that is given as a part of a general course in physical education. If any criticism were to be made it would be, perhaps, that the course is not full enough but supervision possibly overcomes that condition. Cleveland has a course that reaches throughout the eight grades. Denver has a course that covers the eight grades but is rather short as applied to the first three grades. Some of Dr. Gulick's books are used in the intermediate and upper grades. Dr. Gulick's books also are the foundation of the course of study in Syracuse. Many other cities run about the same as those enumerated, with variations to suit local conditions. Few cities give any extensive attention to hygiene instruction in the high school. Here is one of the greatest opportunities for doing good work in hygiene instruction. Girls and boys can be instructed separately and many things brought out that will add greatly to their welfare as adults. Some work of this kind is done in the high school of my own city.

Papers Presented Friday Morning, February 3.

GOOD AND BAD FORMS OF RECORD KEEPING.

WALTER S. CORNELL, M. D., NEUROLOGIST TO THE DIVISION OF SCHOOL INSPECTION, DEPARTMENT OF PUBLIC HEALTH AND CHARITIES, PHILADELPHIA, PA.

The essential records in the work of medical inspection are the child's individual record card, the list of the physical defects and defective children in each school, and the report by the medical inspector to his governing authority. These three forms, it will be seen, correspond to the three essential ones in bookkeeping, namely, the ledger, the journal and the statement. To the three already mentioned we may add the record forms by the school nurse, since the latter has become essential to successful medical inspection.

That the work of medical inspection has so far suffered from the lack of a standard system of record keeping has been commented upon by various writers interested in the subject. Mr. Leonard P. Ayres, writing in *School Hygiene,* December, 1908, remarks:

"The man who will come forward with a simple, rational and practicable system of statistics for medical inspection will confer on the movement a boon of so great importance that he will merit the lasting gratitude of all who are interested in the work. At present, definite information in quantitative terms is meager in quantity and dubious as to quality. To cite a very simple instance: It is almost impossible to get any reliable statistics as to the cases of contagious diseases found in different localities. Diligent examination of all the printed reports obtainable from cities having systems of medical inspection yields very meager results. In most cases the doctor's report shows how many cases of contagious diseases were found, but not how many children were examined in finding the cases. Again, when the number of children examined is stated, it is almost always found on examination that the number given represents not *the number of* CHILDREN *examined, but the number of* EXAMINATIONS *of children.*

"Again passing from a consideration of examinations for the detection of contagious diseases to examinations for the discovery of physical defects, an even greater paucity of available information is discovered."

Discussing the impressive effect of the huge totals set forth in the annual reports of the medical inspection of our great cities, Mr. Ayres further remarks:

"An analysis of these large figures serves to raise grave doubts as to their accuracy and significance." Thus in analyzing the work of the medical inspectors of one large city, he says:

"It is worthy of note that during the year 1904, each medical inspector (according to the figures just quoted) must have visited nearly two schools per hour every day in the year, and that during every day in the year every inspector employed examined over two hundred children every hour."

Again Mr. Ayres remarks, after analyzing the work of the school nurse as stated in an official report:

"This means that they all worked at the stated rate of two examinations per minute; inspection for pediculosis and trachoma every three minutes; and a treatment for miscellaneous ailments, every fifteen minutes. During their spare time, they also gave 4959 treatments in the districts for scarlet fever, measles and diphtheria; and made 910 miscellaneous visits."

The writer of this paper in *The Psychological Clinic* in 1909, also called attention to the lack of uniformity in the official reports issued by various school and health authorities, remarking that as a rule they have not been compiled in a scientific manner, nor have the records of the original physical examinations evidenced a comprehensive understanding of the various defects and diseases encountered. In this article, he urged that the defects which are basic and principal shall be clearly recorded and emphasized; that secondary symptoms, such as headache and catarrh, should only be recorded in such a manner that their secondary character is understood. The number of physical defects reported to the parent for treatment should be noted separately from the number of defects of only minor degree. Non-curable defects, such as weak heart, high palate, paralyzed limbs, and temporary ailments, such as styes, boils and infrequent headaches, should receive separate record from those defects which are made the basis of parents' notices.

Before beginning the consideration of the best record forms to be kept, it is well to note the relation of RECORDS to the other parts of school inspection. The school inspector not only writes records, but journeys to and fro, examines children and takes measures to obtain the correction of defects, and the exclusion of children suffering from contagious diseases. For this reason, the *time element* must be considered in formulating a proper system of record keeping since it is obvious that records, while they should be practical and scientific, must not consume too much time, or the inspector will do very little inspecting. Examples of such time-consuming records will be mentioned later.

The first record form to claim our attention is the individual record of each child, stating its physical condition. If we glance over the various records used by different American cities, it will be seen that the majority of them are modeled upon either those of New York City or the form issued by the state of Massachusetts, showing that the majority of communities taking up medical inspection have created their stationery by the simple process of copying from these two models. Without criticising either of them, it is obvious that this does not mean much of an advance toward a permanent and perfect record card.

We may take it for granted that every record card should provide accommodation for a number of examinations, at least four, since the school life of the average child is eight years. It should also provide for a record of the notification to parents, in case such notification is made, together with the date of such notification and official information as to whether or not the defect has been corrected. The age, grade and social condition of the child should be noted and briefly commented upon on the card in connection with the record of his physical defects, since such information is both of practical value in attempting the correction of the defect, and is of scientific value because from it the prevalence of various defects at different ages and in different social conditions can be determined.

The principal defects from which school children suffer are only ten in number, and for this reason may well be given a definite mention upon the record card, since an inspector is less likely to overlook a defect in a child when he is compelled to make a definite record whether or not it exists. For this reason the eye, nose and throat, the ear, teeth and nutrition should be given permanent space on the card; and the skin, the skeleton, the glandular and nervous systems and the mentality should have a definite mention, although in minor degree.

The simple and most efficient method of recording the most important facts about the eye may be formulated by bearing in mind that the evidence of eyestrain lies in the existence of defective vision or the existence of subjective symptoms, principally headache and tiring of the eyes. The latter when it occurs is usually evidence in itself. Remembering these facts, we make adequate provision for all record of the eyes by stating the acuity of vision of the right eye and left eye separately and the existence of the headache and the fatigue just mentioned. Since the object of medical inspection is not anthropometry, but the proper record of the condition of each child, and the possibility of physical improvement, there should be a record kept of whether or not the child already wears glasses, and if he does, the visual acuity should be tested while he is wearing them. Also if the child wears glasses, the year in which such glasses

were obtained should be mentioned, since it is useless to expect improvement in vision by changing the eyeglasses if they have been obtained from a reputable physician but a short time before.

In connection with the nose and throat the two principal defects are chronic hypertrophied tonsils and nasal obstruction from adenoids. Nasal catarrh may be noted if a permanent symptom; and likewise cervical adenitis; but an evident case of adenoids with a trifling catarrh, and a hardly perceptible enlargement of one of the cervical lymphatics hardly requires the mention of the two latter defects, since catarrh of any part of the body is simply an evidence of an inflamed mucous membrane; and slightly enlarged cervical lymphatic glands are so common and so transient in small children, that their mention is hardly worth while.

Just as in the case of the eye we have to deal with a sense organ as well as an anatomical structure, so in the case of the ear, mention must be made both of the acuity of hearing and the existence of discharging ears. It is well to record defective hearing as such and not as "deafness," since in the minds of many, the term "deafness" like the term "blindness" signifies total loss of function.

The nutrition of children is a matter of great importance, but unfortunately poor nutrition may be evidenced in too many ways to allow of categorical inclusion upon a record card. However, "anæmia," "poor nutrition" and "fair nutrition," may be placed upon the chart, in order to give some idea of the condition of the children. Possibly if this had been done in the past, there would be fewer exaggerated stories of starving school children; but at the same time a clear realization of the condition of the children in the slum districts of our large cities.

The condition of the teeth may be stated by giving the number of decayed teeth found. It is true that some of these may be only temporary teeth, but since dental decay may have an injurious effect upon the general health, this fact may be disregarded. "Missing teeth" are not worth noting, since the empty spaces seen are frequently vacant only for a short time. So may the distinction between temporary and permanent teeth be disregarded on the ground that it is a useless expenditure of energy on the part of the examiner.

The record of height and weight has always appeared to me to be a very useless proceeding, since height and weight bear only an inexact relation to nutrition; the height and weight of a great many children are constantly changing, and the record will never thereafter be looked up because of the mechanical difficulty experienced in finding the age of the child from his stated date of birth, and the correlation of the age with weight and with the height. I would particularly ask for opinions upon this, as I

have never yet found anyone who has made any use of these figures. In fact I know of no such figures systematically gathered throughout a whole community. Figures of the heights and weights of mentally deficient children, delinquent children and poor children, are all valuable in their place, but these studies should be made as separate investigations. As has already been said, medical inspection is a practical subject. The statement of the conduct, efficiency and proficiency of the child appears to me also to be superficial. In a general way, his mentality may be mentioned, so that if it is deficient a note may be carried upon the card; but such nonmedical subjects as his conduct, effort and proficiency, are never looked at by a physician who is already overburdened with hundreds of children; and the school teacher carries a separate record of her own.

A record of the diseases suffered by the child during the preceding term is theoretically a useful thing, but since medical inspection as a rule has succeeded in effecting the examination of children every two or three years at best, it can be seen that it is practically impossible to enter these items. Finally, the card just criticised has provisions for four hundred and fifty entries on an area of 6x3¼ inches; each of these spaces measures 5-16x5-18 of an inch. In the case of eyestrain, such a space is used to cover the whole subject, no provision being made for separate examinations of the two eyes; nor are spaces allowed for the testing of hearing of each ear separately. The back of this card makes a very fair attempt to overcome the difficulties forced upon the inspector on its face side, by giving the diagnosis of the defective condition found and the treatment received. It can readily be seen, however, that while the most prominent defects are thus very properly emphasized, the original records on which these statements are made are too scanty to be of service, so that an amplified and duplicate statement is necessary.

Looking over three or four record cards at hand at the time of this writing, I have one which presents categorically a number of defects whose existence is well worth noting, but which are relatively rare; also defects which are non-curable; also a record of the height and weight; a record of the conduct, effort and proficiency of the child; and finally a record of the diseases contracted during the school term. Provision is also made for two examinations every year, so that space for a total of eighteen examinations is provided. In regard to infrequent defects, or those difficult to discover, such as heart and lung disease, it is difficult to see how the record of health in these respects can be written when our laws as a rule do not allow the medical inspector to undress the child. Noncurable defects on the card mentioned are properly noted, but it seems to me that they would

be better noted separately from the curable defects, so that a certain area of the card may be readily glanced over with the idea of correcting any defects found in that given area; while another area on the card, even if it be simply the bottom line, gives noncurable defects, and by thus emphasizing them, secures their notice.

Another record card at hand simply provides six columns marked eye, ear, throat, nose, skin and orthopædic, with provision for ten examinations in each column. Each of these spaces measures ½x3-16 of an inch. No mention is made of nutrition or of the teeth, nor are the right and left eye and right and left ear mentioned separately, nor is any provision made for the record of the date on which the parent was notified. The nine examinations provided for are ample, since it is a matter of record that in six years of medical inspection which the city has enjoyed, very few children have received more than three examinations, and many have not been examined at all.

Finally, the writer has a card at hand which is a remarkable example of a non-medical mind well trained in bookkeeping This card entirely overlooks the fact that it should accompany the child throughout his school life, giving information to successive teachers and successive medical inspectors of the child's physical condition. It provides for one examination only, after which it is supposed to be sent to the central office and filed away among the archives. The theory is that if the parent, the teacher or the superintendent of schools should desire at any time to know something of Johnny Smith's physical condition, they would not go to Johnny Smith nor his school, but to the central office in the city hall, where Johnny Smith's card, which has been filed with over one hundred thousand others alphabetically at the expense of much money, may be extricated and studied. Why such people who are not directly interested in Johnny Smith should hunt him out is not stated. Meanwhile the parent and the teacher have no record whatever, and the work of the medical inspector is buried alive. A detailed examination of the card shows the age and the grade laid out in stated terms, the age running from one to eighteen years; all of which entries overlook the fact that it is as easy to write eight and three in the appropriate spaces for the age and grade respectively, as it is to find eight and three in a solid block of figures. Besides the blocks of figures occupy useless space; and the years given are ridiculous. Both parents' nationalities are given, although common sense dictates that the nationality of the mother, if she be a foreigner, is the same as the father; and in such event can be learned only by sending for the woman herself. Fine distinctions are drawn between Polish, Russian and Slavonic. Finally, the examination of the list of physical defects

set forth shows a jumble of physical defects, parasitic diseases, causes and effects. Anæmia and pediculosis stand next to each other on the list; nasal catarrh and adenoids; nasal obstruction, nasal catarrh and post nasal catarrh are found "Carious teeth" and oral sepsis are both mentioned, although sepsis in its major sense means an evident infection of the system, and its minor sense may be looked upon as an accompaniment of every carious tooth; and finally phlyctenular conjunctivitis, corneal ulcer, blepharitis and marginalis are mentioned, although any oculist knows that blepharitis is usually due to simple neglected eyestrain, and that corneal ulcer is simply one part of conjunctivitis.

Considering now the list or record of the defective children, together with their defects, it is evident that such a list should be kept in the school for the edification of the medical inspector, the teacher and the school principal (who however, very seldom edifies himself), and the chief medical inspector should he visit the school to scan his assistant's work. Such a list should contain the name of the child, the number of his school room, the defect or defects, the date of examination, and the statement whether or not treatment has been provided. It may be noted also that this list is very useful at the beginning of the school year, since the medical inspector can by its help quickly bring before him all defective cases that have neglected to procure treatment and stir them up with a second notification before proceeding to the routine examination of the whole number of children.

It is worth while to enter into a discussion of the relative merits of the list of defective children just described carried on a large sheet, and the making up of the list of defective children on individual cards. The latter, of course, is a collection of simplified individual cards of those children who have been found defective. The city of Philadelphia uses such a system, the idea being to preserve the list of defective children at the central office in the city hall, in alphabetical order, keeping the school cards intact. This system, which is very expensive, since the clerical work is threefold, is also inefficient, for the simple reason that the only arrangement of a list of defective children is in chronological order, and any other arrangement is simply a disturbance of this best one. The actual result has been, in Philadelphia at least, that these cards are turned in by the thousands at the central office and very little has been done with them. The useful information which might have been gathered by keeping the school lists intact is now made difficult to obtain. The only good reason for such cards is that the school nurse, if she be employed, can handle the record of each case separately, finishing up some records, and holding

others back until treatment or failure is assured. It must be evident since all cases do not need a nurse, and the majority of cases do not secure the services of a nurse, that since the nurse's time is less valuable than the physician's, that it would be a better system for the nurse to take these lists of the medical inspector and copy off for herself on the individual cards such cases as she has to handle. In this way her records and the inspector's records are each kept complete and separate.

In the system of individual cards just described and criticised, it is the custom to use cards of a blue color for the recording of physical defects found, and red cards for *excluding* contagious diseases.

Lastly, the summary of the work of the medical inspector, usually a weekly report, must be considered. Such a summary, if in the form of a weekly report, should give the section of the city covered by the medical inspector; the number of schools assigned to him; the visits required and the visits made. The number of children sent to the inspector by the principal and teachers should be noted as well as the number systematically examined; altogether giving the total number of examinations. The number of recommendations for treatment for the cure of physical defects and the number of exclusions of cases of contagious diseases. Following this summary should be a list of the physical defects for which notices have been issued, and the diseases for which pupils have been excluded. Such a list is well worth the formal printing upon the report, since the use of a well-prepared list serves to standardize the summary, forcing the use by the assistant inspector of medical terms desired by the chief inspector, thereby facilitating the grand summary of the inspector's work by the chief inspector.

This weekly report may have placed upon it also the number of children remaining out of school and the number of children returning to school during the week; the actual names of such children to be carried along. Such a scheme is theoretically a very good one, since it assures the watchful supervision of excluded cases by the inspector, or at least it does if the inspector be honest. Sad experiences, however, including my own medical and personal experience during five years of actual inspection show that the accurate and truthful carrying along by the inspector of excluded children is a most difficult task, provocative of much prevarication on the part of the inspectors. It is very disconcerting to the inspector to realize on Friday night that he has forgotten to look up four or five children who were excluded the week previous, but must nevertheless be reported upon sometime before Monday morning. Of course in a small district or a district in the better parts of the city, the number of exclusions is so small that this entry gives very

little trouble. But in the poorer sections of a large city, where the problem really is large enough to require some formal record, this work had better be left to the school nurse, who by means of her own card system carries along all cases excluded as well as the others until some definite final action is secured.

The card records used by the school nurse are interesting in considering the bookkeeping of medical inspection, but the length of this paper must forbid their consideration here.

HOW TO FIND THE FEEBLE-MINDED CHILD.

HELEN MACMURCHY, M. D., MEDICAL OFFICER, BOARD OF EDUCATION, TORONTO, CANADA.

There are many questions which arise in our mind before we can enter on a piece of work with that whole-hearted absorbing interest and satisfaction by which it lays hold of us and we claim it as our own.

Is it possible, in the present state of civilization and of the world's history? Is it worth doing? Is any good going to come out of it? And besides all that, with life so short and time so precious, is it the best investment of time and life that we can make—to find the feeble-minded child? Yes—for a few of us. The work of Miss Farrell and Dr. Smart in New York, of Professor Norsworthy at Columbia, of Dr. Fernald at Waverley, Dr. Witmer and Dr. Cornell at Philadelphia, Dr. Jelly at Boston, Dr. Barr at Elwyn, Dr. Johnston and Dr. Goddard at Vineland, of Dr. Shuttleworth and Dr. Langdon Down in London, of Miss Dendy in Manchester, show the preëminent value of the expert's leadership, and for them, the answer to the last question is Yes. But beyond question, to most of this audience, the answer to the last question is No.

To educationists, school medical officers, and all those interested in school hygiene, the paramount interest is the mentally and physically normal child. The first duty of schools is to the normal scholar. We may help the scholars much and make them more perfectly normal by removing adenoids, correcting errors of vision, caring for the teeth, establishing a high standard of personal hygiene—especially cleanliness. But when the interests of the normal child are adequately considered, it will be seen that these interests require special education for the feeble-minded child. It is not fair to the rest of the class that, recognized or unrecognized, these worse than backward children

should get, in proportion, ten times as much of the teacher's time as the rest. And yet the feeble-minded child has a right to an education too, and must have more of the teacher's attention than the rest to get anything. Every school medical officer finds the feeble-minded child.

You are all therefore in sympathy with the quest. For it can be done, and it has been done, in London, Liverpool, Manchester, Birmingham, in Edinburgh and Glasgow, in Berlin and Vienna, in New York, Philadelphia, Boston, St. Louis, and all the other great educational centers of the world. It can be done and it has been done by almost every experienced public school teacher whose mind and heart are living. Seldom has a life devoted to education passed without coming into contact once with the child "born short" of brain.

It is worth doing, too. It would save so much money, so much time, so much crime, so much suffering. If we ignore the feeble-minded children in our schools, and refuse to handle them so as to make them—

1. Self-supporting as nearly as may be.
2. Safe from evil doers and evil doings.
3. Happy—for the normal birthright of happiness can only be given to them in a little world of their own adapted to them.

If we refuse this permanent care, then we shall be forced to find them, as we do now, in later life. They will be thrust on our attention, as they are at this moment, in the jail van, the police court, and the prison cell, and we pay the big bill for them all. They will be thrust on our attention in every poorhouse, maternity hospital, and in every charitable institution—those places on the sea of life where derelicts drift, those shores where the wrecks of human-kind are stranded. Little good will come out of finding them there. You cannot make the spoon there—and the horn is spoiled. Not much good comes out of recognizing the feeble-minded twenty years too late—when the schoolboy or girl of 1880 is the unemployable, the good-for-nothing, the incurably lazy, the criminal, the prostitute, of 1911—responsible (or rather irresponsible) besides for children who will carry on to the next generation with threefold or fourfold increase the problem of the feeble-minded.

All this evil may be prevented, and the first step towards its prevention is to find the feeble-minded child. Therefore it is well worth while, in the interest of the feeble-minded individual, the home and the nation. For the first, it admits of no argument, for it is the difference between usefulness and uselessness, happiness and misery, hope and despair. Something has been said of the state, and of the home; one can only say that while for the normal individual all the institutions of family life are, or should be, ideal they cannot be so for those to whom marriage

and home responsibilities are a mockery or worse, and who can only deprive others bound with them in the bundle of life of the joys of home life. "I have no home," said the devoted father of a feeble-minded girl to me the other day. It was true. She ruined the home. Every family finds this out after having spent twenty or thirty years trying to keep the feeble-minded member of the family in the home. They will all tell you then what a mistake it has been—how it has cut them off from society, from legitimate enjoyments, from the widest opportunities of life. What we must now do is to educate everyone in the same position to make use of the experience of other families who have bought that experience so dearly. If it were only to prevent such mistakes as these, to preserve the regrets and happiness of other members of the family, it is worth while to find the feeble-minded child.

Difficulties.

We shall be sure to meet with difficulties. But, to quote a favorite phrase of the premier of Ontario, Sir James Whitney, "Difficulties exist only to be overcome." This is true of our present problem. Our chief difficulties arise from the mental attitude—first, of educational authorities, and second, from the mental attitude of the parents.

It is not unknown that some educational authorities will proudly assure you that there are no feeble-minded children in *their* town or city. There is usually a good motive at the bottom of this remarkable statement. It is akin to the brave front put on by the poor father or mother or brother, or other relative who brings a patient to an asylum. About 75 per cent of them, poor things, will assure you that they "never heard of any insanity in our family." Their hearts are breaking already, and no decent person would add to their distress by arguing the matter. Accept it and sit down quietly and draw them on kindly to tell the story in their own way, and it will not be long before you hear of the uncle who was accidentally killed—in fact, was found dead on the railway line that passed through his farm, of the three first cousins who are "very nervous" and live at sanitariums, and of the brother who took to drinking and it temporarily affected his mind, so that he took the "gold cure" —and then traveled for a year and is all right now. But they think it will not do to call that insanity, and so they don't. Their state of mind is expressed by the old proverb, "It is an ill bird that fouls its own nest." And those educational authorities are in just the same state of mind. They look on the schools and the scholars as their own family. And just as it is a point of honor to say that there is no insanity in our family, it is a point

of honor to say that there are no feeble-minded children in our schools.

Can we overcome this difficulty? Easily. Plenty of patience. There are, in any educational authority, a good many units. There are boards of education, superintendents, inspectors, principals, school medical officers, and school nurses, and—most important of all—teachers. When someone asked the Duke of Wellington of the prospects of the war with Napoleon it is said that he pointed with his thumb to a private soldier who was passing, and answered, "It all depends on that article." You may say the same of the teachers. Some of them will surely help you (but don't get them into trouble with the higher authorities if they do). And the school doctor will be a great help and one of the trustees will bring in a motion and you will get something done—

> "If you can wait, and not grow tired by waiting,
> Or being lied about, don't deal in lies,
> Or, being hated, don't give way to hating,
> And yet don't look too good, or talk too wise"—

you will finally get access to the feeble-minded child.

Your next difficulty will be with the parents. Like ancient Gaul according to Julius Cæsar, all these parents may be divided into three parts:

First: The parent who won't have anything to do with you. You will see them some other day.

Second: The parent who has not yet recognized the mental condition of the child.

Third: The parent who has recognized the mental condition of the child.

We owe to every human being the greatest sympathy and consideration we can give. This attitude should always be characteristic of those who, like doctors, must see things that people show to no one else. And no matter what their attitude to you, your attitude to them should be your best.

In an investigation undertaken in 1910 for the board of education, Toronto, there were reported for examination by the teachers of fifty schools, one hundred and seventeen children who were very backward. The following letter was sent to the parents of these children, inviting them to be present, and only one parent declined the appointment. It seemed likely that he belonged to the first class. Of the remainder, nearly 40 per cent came, often after great expenditure of time and trouble. One mother had, in order to come at all, to bring with her two younger children, one of whom was a baby weighing twenty pounds, whom she carried in her arms. Sometimes a step-mother or an aunt came, sometimes an older sister or brother, but all were glad to come and many of them expressed their thanks to the

board of education for taking so much trouble to help their children. Most of them seemed to have recognized more or less the mental condition of the child. One poor mother, who had been told by one of the school officials that the only thing the matter with her boy was laziness, informed me of this opinion and added in a tone of pathos: "But oh, I *know* it isn't that. It's his mind." (Before the year had closed she came to me to beg me to appear at the police court and give evidence on behalf of this boy, who had been arrested for shopbreaking at the bidding of a bigger boy).

Other parents belonged distinctly to the second class. They had never realized the true state of affairs. One mother after conversing some time, asked me if I thought Johnny would have "to go away somewhere." "Ah, well," I said, "you know, Mrs. ———, somebody will always have to look out for Johnny."

"Oh, yes," she replied eagerly, "of course somebody will always have to look out for Johnny."

"Well," said I, " who is going to do it when you and I are gone?"

She looked thoughtful at this, and before going seemed to be entertaining the idea that this was the best thing she could do for her boy, to get him a place in some institution where he could always be "looked out for."

In all such investigations the first thing to do is to avail ourselves of all the information we can get from anyone who has already been in contact with the child for some time, parents, teachers, and others. A good starting point, if one is permitted to go to the schools, is to ask the teachers to tell you if they have any children:

1. Who are about two years behind the average age of the class;

2. Who have great difficulty in learning things the other children can, or are exceedingly slow in learning.

It is a question of the failure of the mind to get knowledge. It is better to have these interviews with the teachers privately, and not to appear yourself, at least until the work is well and favorably known, in the classroom. The children can easily be sent along with half a dozen others to show their work or drawing, etc., to the assistant principal, or to one of the other teachers, Or the child in question may be sent on a message. In every and any way the child should be protected.

Backward but not feeble-minded children.

Another point is the "differential diagnosis" between really feeble-minded children, and children who are not really feeble-minded at all. They may be children who have really not eyesight enough to learn. A striking case occurred in the investi-

gation above referred to. The boy was thirteen years old. He was in the Junior First Book class—just out of the kindergarten. He could not read. He knew very little. On examination his sight was found to be only 1-60 in one eye and 5-36 in the other. His mother had done her best. She had taken him to one of the "optical parlors" where "eyes are examined free." They had made him glasses to cost $5. She had paid $2, but as she said herself she never seemed to get ahead enough to pay the rest. So the optical parlors kept the glasses and the $2. The mother lost her hard-earned money, for she "went out by the day." The boy lost his education. The City of Toronto and the Province of Ontario paid for his schooling for about seven years, and lost every cent. After suitable glasses were got he could "see fine," as he said himself. He is now at work, but his teacher, who took a great interest in him, gives him a lesson every night.

Defective hearing and word-deafness.

Another group of cases have very poor hearing, or possibly the brain center for spoken language is deficient. Yet they can be taught in other ways and may belong to the normal class. A great deal can be done for deaf children by modern special methods of treating them.

Reversion to earlier type.

A difficult group is the reversion to an earlier type. We have won our civilization hardly. Go back even fifty years—and things were said and done in public that people would be ashamed to do in private now. These cases need to be understood. One such seen in this investigation had, in spite of all his abnormal traits, the very hopeful sign of having rapidly improved. That made the outlook much better.

Long absence from illness.

In all such investigations we find a few cases where the secret of the backwardness is that the child has hardly been at school at all. She was not strong and did not come to school till the age of seven or eight. Then in quick succession she had measles, scarlet fever and diphtheria. So that though the child is very backward we may find the mind perfectly normal.

Unsymmetrical attainments.

It is always very suspicious when we find marked irregularity in attainments in different subjects, as when a child can read a little but has no idea at all of number.

Disciplinary cases.

There are always instances of disciplinary cases sent up in such an investigation. This is often entirely wrong. Feeble-minded children may be troublesome sometimes, but typical troublesome children are not feeble-minded as a rule.

General rules.

The teacher the child had on first coming to school is often a great help, if we can find her. The school history helps. Physical defects are about three times as common in these children as in normal children. Children should not as a rule be examined for a special class before they are seven years old.

Never hurry to a conclusion about any child. Give the full benefit of any doubt. Take time. Sometimes after a long time or some other day a child will finally get his mind into action and vindicate himself.

Always take for granted that the child can do a great deal and value what he does—because, *for him,* that may be more of an achievement than the greatest achievement you and I ever made. In many psychopathologic states one of the chief difficulties seems to be a loss of the normal power of self-encouragement. We have always a feeling of some pleasure and even pride in our performances. We generally find the mark in a sort of way. We can do as well as most other people. But the feeble-minded live under the constant terrible reproach of knowing everyone to be better, stronger, wiser and braver than they.

So in finding the feeble-minded the first rule is encouragement, and the second rule is encouragement, and the third rule is encouragement, and so on until seven times at least. The first thing is encouragement and the last thing is encouragement. One of the most touching things I ever saw was the brave efforts of the Sandlebridge children to fold their hands for grace.

Never finish your examination of the child, or your conversation with the teacher or parents without finding out what he *can do.* After a long time one teacher remembered she had observed that a certain feeble-minded pupil always noticed if anything was out of its place in the schoolroom and put it back. They often love to clean the board, or go a message.

Interesting cases.

All kinds of interesting cases come to light while we are trying to find the feeble-minded. Such was Alister McKinlay McEachren. He was of Highland descent, ten years old, had been at school five years, could not read. As his mother, in her proud, gentle Highland utterance said, "What will be the reason that

my son is ten years old, and he has been at school five years and he cannot read?"

"Alister," said I sternly, "this will never do. Don't you know the Highlanders are the smartest men in the world? How is it you cannot read?"

"Oh, are they?" said Alister, looking at me out of his handsome eyes, "I thought it was the Americans."

That settled it. He was no more feeble-minded than you or I, but was an accomplished truant, and had slipped through the fingers of a half a dozen or more teachers, successfully avoiding any personal effort. We found somebody who taught him to read in two weeks.

Was he a genius?

There was another boy, G. W. S. I have an uneasy suspicion that he is a genius. He was eight years old, and did not seem to be able to read at all, or to add small numbers. His six-year-old brother was far ahead of him. Yet he was quite an authority on polliwogs and knew about their legs and their tails, etc. He had suffered from night terrors when a little fellow. While chatting with his father I was thunderstruck to hear G. W. open his mouth and put the whole situation in a nutshell, in these words, delivered with little hesitation: "Tell you what, if a fellow—a fellow—gets into a class, 'n then he's there a year—'n then he's there another year—he gets stuck!"

Besides all the information given by the parents and teachers, the following should be carefully examined and noted by the doctor:

1. Date and age.
2. Name, address, school, class, etc.
3. Condition of teeth.
4. Condition of nose.
5. Condition of throat.
6. Condition of vision.
7. Condition of hearing.
8. Speech.
9. Reading.
10. Writing.
11. Number work.
12. Hand work.
13. Attention.
14. Memory.
15. Intelligence.
16. Aptitudes.
17. Moral sense.
18. Physical condition.
19. Gout.
20. Coördination.
21. Cause of backwardness, if known.

The tests of Binet and De Sanctis* (translation made by Dr. Goddard of Vineland) are valuable, especially in testing the memory, intelligence, and general mental condition. Professor Norsworthy's work is also indispensable to us, and is a great help. But experience here, as elsewhere, is the great teacher.

One tiny corner of the great field of knowledge we love to make our own, and make our vocational home. Here is our highest usefulness, and therefore our greatest joy. And it may seem strange to you, but none of us here who have ever worked for those whom the French touchingly call "God's children," perhaps because they are often nobody's else, would exchange that tiny corner, even for yours, whatever it may be.

RECENT STUDIES OF FATIGUE IN RELATION TO THE NEED OF OXYGEN.

WILLIAM H. BURNHAM, PH. D., CLARK UNIVERSITY, WORCESTER, MASS.

During the last dozen years many interesting studies of fatigue have been made. In the time allotted to me I could not even give a bibliography of them. These studies have varied greatly in character, from the technical studies of the conditions of fatigue in the muscle, or the nerve cell, or the nerve fiber, and the chemistry of the waste products of fatigue, to the mass studies of pupils in their daily work in the schools. Some of the results of these technical studies have a more or less direct bearing on school hygiene. I shall not attempt to speak of the theories of fatigue and the like, but I wish to speak on one point, namely, the relation of oxygen to fatigue.

Modern studies have shown that nerve cells function intermittently. When you voluntarily raise your arm the process is functioned by the ganglion cells of the brain but the nervous discharge is not continuous. Thus in all its functional activity response is followed by refusal to respond, and this refractory stage in turn by a stage of irritability. The stage of irritability, of response to stimulation, is looked upon as a stage of katabolism, of breaking down, of expenditure of energy, of dissimilation, and the refractory stage as one of anabolism, of building up, of assimilation. The number of responses per second within certain limits depends on the supply of oxygen. The smaller the supply of oxygen the fewer the number of responses, and without oxygen the functional activity ceases altogether. If there is also

*For these tests, see Report of the National Education Association for 1909.

metabolic activity at the synapse as suggested by the studies of Sherrington and as maintained by McDougall, this must require oxygen also.

Recent study of the nerve fiber is also very instructive. It was long supposed by modern investigators that the nerve fiber was incapable of fatigue, that it could function indefinitely, like a telegraph wire or the like. But the condition of this continuous functional ability is not its mechanical character and its freedom from chemical change, but the abundant supply of oxygen that it receives from the blood and the lymph. The nerve fiber is perhaps even more greedy for oxygen than the nerve cell; and in the old experiments that were supposed to demonstrate this immunity to fatigue, it sucked up sufficient oxygen from the air of the room where the experiment was conducted. If, however, the experiments are performed in a chamber where the oxygen has been exhausted the response of the nerve fiber becomes intermittent and after a time ceases altogether.

Many investigations in Verworn's laboratory have had to do with the relation of oxygen to fatigue.* In the earlier studies Verworn and his pupils showed that exhaustion of the ganglion cells is primarily conditioned by lack of oxygen. This raised the query whether the same might not be true for the nerve fiber. Ranke and Ewald anticipated this, and Von Baeyer in 1903 published the report of an investigation in which he succeeded in surrounding the nerve fiber with pure nitrogen in a chamber prepared for that purpose, and under these conditions, the nitrogen merely serving to exclude oxygen, he found that the nerve fiber soon lost its irritability, but recovered again when placed in oxygen. The conductivity of the nerve also ceased when it was surrounded with nitrogen and recovered again when placed in oxygen.

Oxygen is necessary, as shown by Fillié, even when the nerve fiber is immersed in a normal salt solution. The only difference is that fatigue comes less quickly in this case because to some extent the toxic products of metabolism are washed out by the salt solution. Immersed in either a gas or a liquid free from oxygen the nerve soon loses its irritability and its conductivity; but it recovers fully when oxygen is supplied again.

A long series of investigations in Verworn's laboratory have shown the need of oxygen for the functioning of the nervous system of vertebrates. More recently, studies by Baglioni and Fröhlich have shown that the nervous system of invertebrates also needs oxygen.

Fröhlich finds an interesting relation between the need of oxy-

*For references, see the bibliography at the end of this paper.

gen in individual nerves and the velocity of nerve conduction under similar conditions. In the nerve of a frog with a rate of conduction of twenty-five meters a second the suffocation period is one hour; for a nerve of the *Aplysia limacina,* a small mollusk, where the rate of conduction is only four tenths of a meter, the suffocation period is eight hours; that is, the slower the process of oxidation the less the need of oxygen, and the reason that the *Aplysia limacina* needs so little oxygen is because the processes of oxidation are so slow. It is fair to assume that in warm-blooded animals, where the rate is thirty-two meters per second, the need of oxygen will be proportionally greater.

In case of children relatively more oxygen is necessary than in case of adults. How much more is needed is roughly shown by the relatively greater amount of CO_2 produced by children. For each kilogram of body weight in the adult perhaps a third less CO_2 is produced than in case of the boy ten or twelve years of age.

It is not necessary to add that oxygen is no less essential when supplied to the nerve by the indirect method of respiration and the circulation and the oxygenation of the blood in our bodies than it is when supplied directly to the nerve in our laboratory experiments. Apparently within certain limits the greater the supply of oxygen the more work can be done, and oxygen postpones fatigue and causes rapid recovery from fatigue.

After each nervous discharge the equilibrium of the nervous elements is automatically restored. But there seems to be an alternation of longer and more general periods of anabolism and katabolism. During waking hours the power of nerve response seems to be reduced and the toxic products of functional activity exert an inhibitory influence. Thus equilibrium must be restored by a prolonged period for rest and building up. The best illustration of this perhaps is the alternation of our waking and sleeping life. We sleep when the power of response, the general irritability, is lessened. We waken when the equilibrium is restored and the irritability becomes maximum. We have reasons to suppose that a large supply of oxygen aids assimilation during these longer periods as well as in the shorter ones.

Again in normal physical exercise the inhaling of oxygen retards fatigue. Dr. Anderson has experimented with athletes giving oxygen before and after running and after exercise. From the results he concludes: "Oxygen reduces the pulse rate if taken before the run or if taken both before and after exertion. The gas greatly relieved the dyspnœa which was evident after each run. If oxygen is not taken, the heart rate is quickened and does not return to normal beat so quickly."

Another class of exercises approaching this subject from a different side are significant. They have had to do with the effect of school work on the physical processes.

Many investigations indicate that the breathing and oxygenation of the blood are interfered with. MacDonald showed that the breathing of children during brain activity becomes shallow, and he concluded that the lessened oxygenation of the blood stands in direct relation to the difficulty of the mental work.

Perhaps the most interesting experiments are those of Graziani, who tested the influence of school work in a long examination period on the blood.

Graziani's subjects were university students and children of the fourth and fifth elementary classes. The observation of the blood was made first in case of all subjects at least a month and a half before the examinations began, that is, at the time when preparation for them had not yet begun, when therefore at least a normal amount of mental work was being done and the strain had not yet reached that degree which immediately preceded the examinations. The tests for comparison were usually made some days before the examinations. Times when the subject was in a period of nervous excitation were carefully avoided. Both tests were made always in the forenoon at nearly the same hour, so that always similar conditions as regards rest and the taking of food might be obtained.

Graziani's results were as follows:

At the first test he had eighteen university students and seventeen children of the fourth and fifth classes, but of these at the second tests only ten students and twelve children were available. It is noteworthy that all the subjects had suffered great loss of weight, which varied between two and ten kilograms, an average of 3.9 kilograms per hundred of body weight.

As regards the number of blood corpuscles the results do not agree. In some cases the number is decreased, in others it is increased, and it is impossible to draw any conclusions in regard to the significance of these variations.

On the other hand the lessening of the amount of hæmoglobin is noteworthy. In all subjects this was observed with an average decrease of about 10 per cent.

In tests made by Graziani of children of four and five years of age in the elementary classes it was found that the only noteworthy and constant difference between the first and the second tests concerned the content of hæmoglobin. The diminution of this amounted on the average to 7.4 per cent. The body weight was sometimes slightly decreased; sometimes it showed a slight increase. Considering the fact that all the subjects were in the period of development, it is clear that an increase in the case of all subjects was to be expected.

Especially interesting were the results which Graziani found in experiments on himself and on a small servant in the hygienic institute, an intelligent twelve-year-old boy. In order to be sure

that the changes that occurred were actually conditioned by extreme brain work and not dependent on other courses, such as change of habit, difference in the time of the year, etc., it seemed desirable to determine whether intensive mental work for a period of some hours exercised an influence on the number of blood corpuscles, etc.

For several hours Graziani busied himself with a kind of work that was new and fatiguing to him, consisting of a long series of arithmetical computations. He worked at this so long that he actually felt himself incapable of continuing the work. Likewise he had the boy do the same work and permitted an interruption of it only when he had repeatedly declared that he was tired, and when he seemed to be no longer in a condition to continue the work.

The test of the blood was made the first time immediately before the beginning of the work, and the second test immediately after the finishing of the work. The detailed results are given in the following table:

Before the Work			After the Work	
No. of Red Blood Corpuscles	Hæmo-globin	Hours of Work	No. of Red Blood Corpuscles	Hæmo globin
5,050,000	80	4	4,800,000	72
5,200,000	80	4½	5,000,000	75
4,920,000	75	5	4,950,000	70
4,720,000	80	6	4,600,000	72
4,800,000	78	6	4,850,000	75
5,020,000	80	5	5,100,000	73
4,900,000	75	5	4,800,000	70
4,900,000	78	4½	4,950,000	72

Graziani, Dr.: Der Einfluss der übermässigen Geistesarbeit auf die Zahl, auf den Hämoglobingehalt und auf den Widerstand der roten Blutkörperchen. Zeitschrift für Schulgesundheitspflege. XX Jahrgang, Nr. 6, 1907, page 382.

The variations in the number of the red corpuscles was not significant, but the decrease of the amount of hæmoglobin was noteworthy. In the case of Graziani himself the average decrease was 7.5 per cent and for the boy about 8 per cent.

Interesting evidence of the advantage of an abundant supply of oxygen for brain work is furnished also by the modern outdoor schools for anæmic and tuberculous children. The improvement in their health has been marked; their height and weight have increased, and a large percentage have been cured. In the fresh-air school at Providence, held in an ordinary schoolroom with one wall taken out—tests of the hæmoglobin were made. The result showed an increase from 74 per cent on entering the school to almost 84 per cent, after five months; and after dropping back in vacation another increase from about 74 per cent in September to 84 per cent in June. With the better blood richer in oxygen is correlated better ability to do school work.

In spite of the illness of these children, in spite of the difficulties in pursuing certain scholastic occupations out of doors,

and sometimes in spite of a shorter school period, the report has been that they have done as well or better in their studies than their indoor companions.

Double doses of air, double doses of food, half doses of work, has been the watchword of the advocates of outdoor schools. But apparently the half dose of work with the double supply of oxygen has a greater effect than the full amount of work of the ordinary school.

When we add to these results the significant observations that have been made in regard to the deterioration in mental work likely to appear when the supply of oxygen is interfered with by any cause, such as an adenoid growth or occlusion of the nostrils artificially as in Kafemann's experiments, and the great improvement that usually results from the removal of the adenoids or other hindrances to breathing, we see again the need of oxygen.

While the brain can continue to function when the supply of oxygen in the atmosphere is greatly reduced, and, according to the investigations by Speck, does not actually strike work until the oxygen is reduced to about 8 or 9 per cent; nevertheless continued work in an atmosphere where the oxygen is considerably reduced is likely to be distinctly injurious; and even where the reduction of oxygen is no greater than in badly ventilated rooms it is likely to reduce the efficiency. While the oxygen supply is only one factor among many it seems to be a very important one. While no one of these many investigations is altogether convincing, the result of all of them taken together is very significant and shows that an adequate supply of oxygen is an essential condition of efficient brain activity.

I have presented what seem to be well-established facts. To give a brief *résumé*, the chief points are as follows:

1. The essential condition for the functioning of the nerve cell is an adequate supply of oxygen.

2. An essential condition for the functioning of the nerve fiber is oxygen.

3. Both the nerve cell and the nerve fiber are subject to fatigue. They recover more rapidly when supplied with oxygen.

4. The amount of oxygen needed seems to depend on the number of responses of the nerve cell per second and upon the rate of conductivity in the nerve fiber, i.e., the more efficient the functioning the more oxygen is required.

5. An adequate supply of oxygen is an essential condition for the functioning of the human brain. The brain strikes work, as shown by the experiments of Speck, when the amount of oxygen in the air is less than 8 per cent, and the efficiency of brain function is decreased when the amount of oxygen is decreased by an adenoid growth, or the like, or by artificial occlusion of the nostrils.

6. In extreme fatigue the amount of hæmoglobin in the blood is reduced.

7. In outdoor schools the efficiency of the pupils in brain work is increased and also the amount of hæmoglobin in the blood is apparently increased.

The law requires pupils to attend schools where the amount of oxygen is decreased and also the air is stagnant, overheated, too dry, impregnated with bad odors and often laden with dust and bacteria. They are expected to do brain work, an essential condition of which is an adequate supply of oxygen. From the point of view of school hygiene the question is raised, why normal children should not be permitted the supply of oxygen that is an essential condition of the work required of them as well as children who are ill.

BIBLIOGRAPHY.

1. AYRES, L. P. Open-air Schools. N. Y., 1910. 165 p.
2. BAYER, H. Das Sauerstoffbedurfnis des Nerven. *Zeitschrift für Allgemeine Physiologie,* Jena, 1903. pp. 180-183.
3. BAGLIONI, S. L'eccitabilita diretta dei centri nervosi agli stimoli artificiali. *Zeitschrift für Allgemeine Physiologie.* Jena, 1910. Vol. 10. pp. 87-136.
4. BURRIDGE, W. An Inquiry into some Chemical Factors of Fatigue. *The Jour. of Physiology.* London, Dec. 31, 1910. Vol. XLI. No. 5. pp. 285-307.
5. FILLIE, H. Studien über die Erstickung und Erholung der Nerven in Flussigketeiten. *Zeitschrift für Allgemeine Physiologie.* Bd. 8, 1908. pp. 492-511.
6. FRÖLICH, F. W. Experimentelle Studien am Nervensystem der Mollusken. *Zeitschrift für Allgemeine Physiologie.* Jena, 1910. Vol. 10. pp. 384-536 and Vol. 11. pp. 121-144.
7. GRAZIANI, A. Der Einfluss der übermässigen Geistesarbeit auf die Zahl, auf den Hämoglobingehalt und auf den Widerstand der roten Blutkörperchen. *Zeitschrift für Schulgesundheitspflege.* 1907. XX. Jahrgang. Nr. 6. pp. 337-353.
8. HEATON, T. B. Zur Kenntnis der Narkose. *Zeitschrift für Allegemeine Physiologie.* Jena, 1910. V. 10. pp. 53-62.
9. KAFEMANN, R. Ueber die Beeinflussung geistiger Leistungen durch Behinderung der Nasenathmung. *Psychologische Arbeiten,* Leipzig, 1902. pp. 435-453.
10. MACDONALD, A. Über den Einfluss der Gehirnarbeit auf die Atmung der Schüler. *Zeitschrift für Schulgesundheitspflege.* 1896. pp. 539-540.
10a. MCDOUGALL, W. The Conditions of Fatigue in the Nervous System. Brain, 1909. Vol. XXXII. pp. 256-268.
11. THÖRNER, W. Weitere Untersuchungen über die Ermüdung des makhaltigen Nerven: Die Ermüdung in Luft und die "scheinbare Erregbarkeitsteigerung." *Zeitschrift für Allgemeine Physiologie.* Jena, 1910. Vol. X. pp. 29-52.
12. —— Weitere Untersuchungen über die Ermüdung des markhaltigen Nerven: Die Ermüdung und die Erholung unter Ausschluss von Sauerstoff. *Zeitschrift für Allgemeine Physiologie.* Jena, 1910. Vol. 10. pp. 351-366.

THE FORMATIONS AND FUNCTIONS OF HYGIENE COMMITTEES FOR UNIVERSITIES.

MAZYCK P. RAVENEL, M. D., PROFESSOR OF BACTERIOLOGY, DIRECTOR OF HYGIENIC LABORATORY, AND CHAIRMAN COMMITTEE ON HYGIENE, AND WILLIAM DODGE FROST ASSOCIATE PROFESSOR OF BACTERIOLOGY, UNIVERSITY OF WISCONSIN, MADISON, WIS.

The position of a university or any large educational institution in regard to its students is a peculiar one, involving grave responsibilities of many kinds. Boys and girls are brought from their homes from greater or lesser distances, and perhaps for the first time in their lives are freed from the restraining influences of home life. These students collect in various dormitories or lodging houses and mix together on the campus, in classrooms, and in various assemblages incident to university life. The responsibility of the institution is, therefore, an exceedngly grave one. It takes the place of the parent or guardian to this mass of students. The danger of epidemic diseases, which is always present when numbers of people are brought together, is constantly present. That institution which looks only to the education of the mind through the completion of a fixed course of study falls very far short of its true functions. Those of us who are interested in the teaching of hygienic life see in every educational institution a golden opportunity to spread the doctrine of good living. Education after all is designed to fit one for a useful career in life and such a career demands first and foremost a vigorous and healthy body.

Most of our institutions like Topsy have "just growed." The old buildings, which are objects of reverence and affection to many, were built at a time when our youth perhaps possessed more vigorous constitutions than those which the present day fast living has brought about, and when the principles of lighting and ventilation were not as well understood as at the present day. Partly through reverence, and partly through the necessities of the case, almost all institutions are still utilizing many of these old buildings, and large classes are held in rooms absolutely unfit to furnish suitable accommodations.

History.

A history of the movement for better things in health matters at the University of Wisconsin will serve to elucidate many of the considerations which we wish to bring before you. Although the university is still comparatively in its youth, having recently

celebrated its fiftieth anniversary, many of the buildings are antiquated as regards health matters. A few years ago several of the professors, recognizing that there was no one connected with the university whose special duty it was to look after the sanitation of the buildings and the health of the students, asked the president to appoint a committee on university hygiene. The first committee was composed of representatives from the departments of bacteriology and hygiene, physiology, physical training and home economics. The work was developed along several lines.

VENTILATION.

First, an attempt was made to secure better conditions in the classrooms and offices. Where artificial means of ventilation were not provided the windows were fitted with window boards which permitted the raising of the lower sash without producing direct draughts on the occupants of the rooms. In most of the buildings a combined system of ventilation and heating had been installed. Direct radiation from the steam radiators was supplemented by passing air over steam coils by means of fans and blowing this into the rooms through galvanized iron channels. This apparatus was used for the most part only in extremely cold weather. When the weather was not cold enough to require the use of both systems no artificial ventilation was given at all. The committee insisted that the fans should be used for ventilation and not merely to supplement the heating of the rooms. This improved matters considerably, but still many complaints came in to the committee from professors and students alike that the rooms were stuffy, close, causing headache and sleepiness.

HUMIDITY.

A study of the humidity of the air in a number of these rooms was next undertaken, and it was found that the moisture was frequently as low as 20 per cent and some times as low as 14. The moistening of the air was brought about by the introduction of steam jets into the ventilating flues at or near the fan so that the moisture would be thoroughly mixed with the air passing into the rooms. Examination of these rooms after this showed that the air was fairly well moistened and the comfort of the occupants of the rooms was greatly increased. Several of the professors who had used these rooms for ten or more years stated that never in their experience had they lectured with as little fatigue and discomfort. The committee has several times asked for funds to make more complete studies of the air of classrooms, but it has not been able to procure them up to the present time.

It is not believed that conditions at Wisconsin were worse than those at many other institutions and yet the actual state of affairs was represented by the following incident. The matron of the woman's dormitory went into the room of one of the girls and, noticing the bad air called the girl's attention to it, and received this reply: "What, is the air bad here? Since coming to the university I have gotten so used to bad air that I do not notice it any more."

FIG. I.

WATER.

The university had a pure water supply but everywhere the common drinking cup was in evidence, some installed in the early days of the university, but some quite recently. The committee succeeded in having all of these drinking cups abolished and in their places, sanitary drinking fountains have been installed throughout the university. These fountains were devised at the university and made by the mechanics connected with the institution. The cost was estimated at $5 each. Fig. I.

Sweeping.

A third matter to be considered was the cleaning of the buildings. Dry sweeping and dusting were the usual customs. In several of the buildings the committee succeeded in having vacuum cleaners introduced. In two buildings permanent systems have been introduced, and in two, portable machines are being tried out. In selecting a type of vacuum cleaner, the committee found that while there was evidently a good deal of difference in the relative cleansing power of the machines there was no described method of testing them. Some members of the committee have undertaken a study of this problem, the results of which are about ready for publication. In anticipation, however, it may be said that while the permanent systems vary in their ability to clean, they are all satisfactory from a hygienic standpoint; that the portable cleaners are all, so far as tested, less efficient in their cleaning power, and that they all have an unsanitary feature of very considerable importance; namely, the discharge of a considerable number of bacteria into the air again. Such machines instead of reducing the danger from air-borne germs may actually increase it.

Toilets.

The toilet rooms of the university have been objects of especial care. Where possible, ventilators have been put into these, but unfortunately change in such facilities often involves a heavy expense and in most instances it has been impossible so far to make any radical changes. The supervision exercised has, however, improved matters considerably. The roller towel has been banished from the university almost entirely and in its place individual towels are provided. A special towel holder and soiled towel box in one, so arranged that the top towel of the pile may be used and then passed over a "Ω" shaped rod into the compartment for soiled towels has been installed throughout the university. A model of this towel rack is here shown. Fig. II. It is the device of three members of the committee and has served an excellent purpose. There is some increase in the expense of laundry but we feel that this is money well spent. As an example of some of the difficulties such a committee has to contend with at times we may relate that in one department of the university the dean objected to the increased laundry expense, slight though it was, and without consulting the committee or any one else had these small hand towels sewed together into roller towels. Fig. III.

Gymnasium.

At the University of Wisconsin physical training is compulsory during the first two years of student life. Consequently the uni-

versity gymnasium is likely to become an important focus for the distribution of disease, but if properly managed may serve as a valuable center of educational influence along sanitary lines. The committee went vigorously to work at this building. Spitting was common, some of the instructors even believing that it was necessary to spit during exercise. Members of the committee attended all indoor games and kept watch on the careless spitting of the players. In two years' time this habit has been entirely

FIG. II.

stopped and it is a very rare occurrence to see anyone spit about the gymnasium, or to find the marks of spit on the floors. Under the influence of the committee the gymnasium has been cleaned from top to bottom, new mats have been provided, varnish and whitewash applied, and very important changes made in the toilet rooms. Formerly any slight wound in the gymnasium meant suppuration and slow healing. This condition of things has greatly improved. Every student was formerly familiar with what is generally known as "gym itch" and "gym sores." While these

exist to a certain extent at the present time, they are rarely seen. The committee has made a number of analyses of the water in the swimming pools, both chemical and bacteriological, and the hygienic laboratory is now preparing to publish the result of these examinations.

FIG. III.

LODGING HOUSE INSPECTION.

Wisconsin has no dormitory system with the exception of one building for girls, which does not lodge more than one tenth of the total number. The students are therefore domiciled at private rooming and boarding houses in various parts of the city. Natu-

rally the Greek letter fraternities and sororities flourish and there are upwards of thirty lodges in the town. The university regents on the request of the committee have for two years past granted money for the inspection of student boarding and rooming houses. A trained nurse is employed, one hundred and seventy houses have been inspected and a record made of them. A few houses have refused to allow inspection, but as a rule the landlords and landladies have coöperated with the committee in trying to improve the standard. It is proposed to make from one to two inspections yearly and to provide students with lists of the accredited houses,—that is, those houses which have such qualifications in regard to lighting, ventilation, heating, bathing and toilet facilities as render them desirable habitations.

Medical Adviser.

The university had never made provision for a medical adviser for the students. When a student was sick he went to one of the physicians in the city or not as he saw fit. There was no system even of keeping a record of illnesses. Cases of smallpox have appeared in the classrooms and in 1908 a severe outbreak of typhoid fever (forty-one cases in one boarding house) occurred, which would probably have been prevented had proper medical supervision free of charge been provided. Excuses were granted for nonattendance at classes, etc., by physicians who had no connection with the university. The committee spent a great deal of time in trying to evolve some plan for the correction of this evil and finally recommended to the president the appointment of a medical adviser. This proposition was considered favorably by the board of regents and the matter was then put into the hands of the executive committee of the medical school. Several of its members were also members of the hygienic committee. In February, 1910, an office was opened and it was not long in proving very popular with students. In less than one year the staff has been enlarged from one physician to three, with three assistants, two of whom are trained nurses. We believe that much epidemic sickness of a minor character has been avoided by consultation with the university physician, who insists on isolation in such cases. More than three thousand students have consulted the medical adviser during the year.

Emergency Kits.

Accidents of greater or less severity not infrequently happen in the laboratories of the university, especially in chemistry and engineering. Emergency kits, designed by the committee, have been placed throughout the university. They contain absorbent cotton, assorted bandages, a tourniquet, adhesive plaster, safety pins, carron oil, boracic acid ointment and aromatic spirits of

ammonia. Each article is plainly labeled. Those on the drugs give the indications for use and the dosage. Charts giving directions for first aid to the injured have also been distributed. Those obtainable have not been satisfactory and the committee is now taking steps to obtain better ones, which will be distributed.

EDUCATION.

Apart from the practical work which has been outlined the committee has been strongly impressed with the necessity of educating students along hygienic lines. It has tried in every way to give and to foster instruction in the principles of hygiene. The department of bacteriology and hygiene has for some time wished to make a primary course in hygiene compulsory on all students entering the university. The committee has aided the department as far as possible in this work. Up to the present time it has seemed impossible to require work from each student in the university, but both the department and the committee are impressed with the necessity of this and are working toward such an end. In the meantime an elective course has been offered. This is primary in character and no preliminary studies are required. It consists of eighteen lectures with assigned reading and an examination, for which one hour of credit is given. This course is repeated in each semester of the scholastic year. The lectures are given almost entirely by men connected with the university, especially those in the departments of physiology, physical training, bacteriology and hygiene, and chemistry. At the request of the committee the regents have for several years granted a fund of $300 for lectures. The object of these lectures is to bring to the university men prominent in sanitary work, hoping thereby to interest the professors as well as the students in the study of hygiene and to convince them of its importance and its practical value.

Institutions of learning should strive to have their buildings perfectly equipped from a sanitary standpoint. Many institutions, where technical departments exist, have model machine shops, creameries, cow stables, libraries, etc. They are leaders in these various lines. Schools, colleges and universities ought to lead in sanitary construction, sanitary equipment, and sanitary care. Classrooms and laboratories ought to be models of sanitary excellence as well as of convenience and attractiveness. The educational value of such buildings far outweighs any additional expense involved.

EXHIBITS.

In connection with the educational work which can be done along the line of hygiene, mention ought to be made of the value of exhibits, museums, etc. Collections of models and plans are an

excellent means of public education. Permanent museums of hygiene are desirable, not only as aids to class work, but for the instruction of the general public, and it would seem desirable that various sanitary appliances might be exhibited where the public could study them. Such museums should contain also exhibits which would illustrate the important advances made along the line of public health, and the results which have been accomplished. They should contain models showing the various aspects of water supply and purification, the disposal of sewage, the details of milk production and distribution, working models illustrating methods of ventilation, types of bubble fountains, etc.

Janitors.

In Wisconsin, as elsewhere, we are largely dependent on the corps of janitors for the proper care of the buildings and the observance of regulations concerning their care. The superintendent of buildings, who has charge of the force of janitors, has agreed to call them together for instruction, and the committee has outlined a course of lectures for them in which such subjects as lighting, heating, ventilation, cleaning, etc., will be discussed in a simple and practical manner.

Organization and Personnel of a Hygiene Committee.

Our experience has taught us that in order that hygiene committees may do efficient work certain features in regard to organization and the powers given to them are necessary. We have not been able to solve certain questions as yet, but the following points seem clear: The hygiene committee should be composed of men who are experts in various matters with which the committee has to deal, and it would seem desirable to have a representative from such departments as chemistry, bacteriology, engineering (as heating or ventilation expert), physical culture and home economics. The chairman of the committee should be the health officer of the institution and would ordinarily be a physician, although what is really needed is a person with special training in health matters.

Of more importance perhaps than the personnel of the committee are its functions and powers. If it is an ordinary faculty committee, it has only the power to make recommendations and to enforce such regulations as may be adopted by the faculty. The committee ought to possess this power, but in addition should have authority derived directly from the governing body—the regents or trustees—since its greatest service to the institution would often come through the duties which it might perform for this body, and its value depends very largely upon the powers delegated to it by such a governing body.

This committee should have power to pass upon the location, construction, and arrangement of new buildings so far as these items have sanitary significance. It should have the power to dictate the selection of such parts of the equipment as have hygienic significance and to decide upon the way in which the buildings must be kept. This would include the method of running the ventilating apparatus, the regulation of heat and moisture in the rooms, the way in which the rooms are to be cleaned, the type of vacuum cleaner, the kind of water, the type of drinking fountain and similar matters. In matters pertaining to the health of the students, this committee, through its chairman, ought to have practically the same powers as conferred on boards or commissioners of health, which would include authority when infectious diseases exist to enforce quarantine, and to disinfect the buildings of the institution, or the rooms of students, when these are not properly cared for by the local health authorities.

In institutions where dining rooms, lunch counters, etc., are conducted in university buildings and under the university authorities the hygienic committee should have supervision of the food supplies so far as expert advice is needed, and should from time to time see that the preparation of food is well carried out. Where this service does not exist or where it is utilized by only a portion of the students, the committee should be active in the inspection of boarding houses, and in the examination of public food supplies such as milk, ice, etc. The work devolving upon the committee in this regard will, of course, vary with the enforcement of the laws in individual cities in which the institution may be located.

The cost of analyses of water, milk, food, etc., will vary with the size and equipment of the institution. Generally speaking, however, the cost will be small as most institutions are provided with such facilities. Whatever the cost, it is money well spent. Preventive medicine is the cheapest life insurance.

Papers Presented Friday Afternoon, February 3.

SHOULD THE EXAMINATION OF THE EYES OF SCHOOL CHILDREN BE CONDUCTED BY THE TEACHER OR THE SCHOOL PHYSICIAN?

BY MYLES STANDISH, M. D., S. D., WILLIAMS PROFESSOR OF OPHTHALMOLOGY, HARVARD MEDICAL SCHOOL, BOSTON, MASS.

That the eyes of school children should be watched by some one connected with the schools is obvious. This observation has, or should have, two points of view.

1st. The effect of the school life on the child's eyes.

2d. The effect of the child's eyes on the school life.

In the first instance the danger is that the child may acquire a myopia, or increase a natural myopia until it becomes a handicapping infirmity.

In myopia the axis of the eye is elongated beyond the point where parallel rays of light should come to a focus upon the retina and all distant objects produce a blurred image. This defect cannot be corrected by the accommodation, and, therefore, no voluntary effort of the child enables it to see any better in distance.

The myopic child will, therefore, have attention drawn to it by the most casual examination with the test types.

The child with eyes whose focal length is too short (hyperopic) is a much more complicated problem. Here indeed, if the error is so great that the child's accommodative apparatus is not able to advance the focal point for parallel rays so that it will fall upon the retina, the child also sees poorly in the test-letter examination and is easily detected.

Many children, however, whose ocular school life is very burdensome to them, and whose headaches, minor nervous ailments, irritability, perverseness and stupidity are discouraging to the teacher and demoralizing to the classes to which they belong are not included in either of the classes enumerated above, but in the group which have focal errors which are correctible by the accommodative apparatus.

These children in order to see clearly in the distance use their focusing apparatus every moment they are awake with the fatigue and exhaustion of their nervous reserve which would be present in every one of us if we were compelled to look constantly at an

object twelve to thirty inches from our eyes without the opportunity for rest which is offered by looking at some object farther away.

To this group, therefore, belong a large proportion of the children who would come under the second point of view before stated.

It is obvious that this very important group may entirely escape the ordinary school test-card examination.

Upon this fact is based the argument that these examinations should be conducted by the school physician.

Would such an examination by the school physician be better for the child or the school than the examination by the teacher as now conducted in most schools?

The examination by the school physician if limited to the card-letter test would be of very little more value than when it is conducted by the teacher. If a more thorough examination is to be made, it is necessary for the physician to take the child into a dark room and by instruments of precision estimate the child's refractive condition objectively, but in this connection it must be remembered that in the all-important age, the last half of the first decade of life, the child has its maximum accommodative power and in the endeavor to watch apprehensively the examiner is prone to exercise its accommodation to the utmost. This action entirely vitiates the accuracy of the objective examination and the result is either an error or the examination is frankly a failure.

Thus if the doctor's examination is to be better than the teacher's, it must be conducted with belladonna in the eyes to prevent accommodation. Such an examination takes from twenty minutes to half an hour and when completed is a satisfactory scientific fact, but has no certain relationship to the question in hand, viz. Are the child's eyes exerting a deleterious effect upon the child's school life?

That question must be answered in some other manner because the great body of hyperopic children have a nervous balance of such stable equilibrium that no nervous phenomena develop until much later in life, or some intercurrent affection so reduces their resistance to nervous irritations that undesirable symptoms follow.

Such an examination, moreover, demands an amount of time and skill that few school physicians have at their command for this purpose.

If then in an important group of school children neither the examination with the test-letter card, nor an accurate scientific examination of the children's eyes is to be relied upon as indicating what children should be advised to use glasses, to what shall we look for the most important factor in this decision?

In no other direction than to the symptoms. If the child has headaches, scowls at his work, has muscular twitching, is inattentive after short application to his books, is irritable, or is stupid in his studies, and bright in the playroom, then the presence of a hyperopic or other error of refraction becomes of importance.

The question to be considered is then, in view of the facts as stated above, in what manner, by whom and to what extent should the schools examine the eyes of school children?

Any intelligent teacher with the letter test-card examination can pick out the children with sub-normal vision. Such individuals should be referred to an expert in order to be sure the school life is not producing any active changes which are causing deterioration of vision, or impairing the health of the eyes. This implies more than an ability to conduct a proper examination of the refraction and demands the services of a skilled oculist which, from the nature of the case, the school physician is not.

The other group in which the nervous symptoms are prominent, and to whom I have devoted so large a proportion of the paper, are to be selected for treatment by the symptoms alone, and for the observance of these symptoms, no one, not even the child's parents, has so good an opportunity for observation as the teacher who has a watchful eye upon the pupils during all their working school hours.

There is no doubt that this watchful observation is becoming more and more common among teachers, and not from reading medical essays upon the subject, but from the fact that their interest has been excited in the subject from their practical efforts in testing the children's eyes with the test-cards.

There is a practical advantage in these examinations being conducted by the teachers in that the parents recognize the fact that the examination is more or less superficial and feel that the eyes should be examined by someone really capable; whereas, if an examination is made by a physician, no matter how superficial or imperfect that examination may be, the parents are apt to assume that the result is final.

I have known well-meaning parents who have allowed children to suffer for years, relying upon the report of a physician who after a superficial examination had not reported any trouble with the eyes.

It will be obvious, I believe, that the teacher's report on the eyes may be of much more service to the child than a hasty examination by a physician.

Under these circumstances should the school go farther and have all, or certain groups of children, examined by expert oculists?

The present system under which the parents are notified to themselves employ an oculist to examine their children's eyes has

worked fairly well from a practical point of view, in the cases of all the children whose parents recognize the importance of the problem, and are not prevented by parental vanity from allowing their children to wear glasses, and even where this reluctance on the part of the parents acts to obstruct the progress of the examination, proper tact and knowledge on the part of the school nurse when visiting the parents will generally make the situation clearer. But if the school should undertake to examine the eyes of all children expertly by means of paid oculists, so few children could be properly examined in a day by one examiner that the expense would be very great, and an expert examination is of no value unless it is followed by wearing a proper glass. The probability is that it would be more difficult to induce the parents to purchase glasses and to have their children wear them if they were actually thrust upon them by the school examiners as the result of an examination for which they themselves were not at all responsible, in which case the schools would not only have to pay the oculist but also be obliged to pay for the glasses, and it is to be remembered that the cost of the first pair of glasses is but a minor expense. The breakage would greatly increase the burden, and change of the refractive condition in youth might require the prescription of a succession of glasses.

It might be said that this would only be necessary in those cases in which the parents were unable to employ a suitable oculist and buy the glasses. It may be remembered that this was the method under which the furnishing of school books was first undertaken, but under our present political conditions such a method for the relief of the parents of a part of the children soon leads to the assumption by the schools of the entire burden.

If, then, it appears to be impolitic to assume the responsibility of the correction of the errors of refraction and the examination by the school physician is simply a snare under the feet of the children and their parents, whereby imperfect and superficial examinations would be relied upon to the detriment of the children's health, there is no valid reason which can be urged against the examination of the eyes as now conducted by the teachers, except the one often expressed, that the teachers are overburdened, and of this I am not in a position to judge.

From an oculist's point of view, however, it is plain that the practical result of the examination by the teachers is efficient and leads up to proper care of the children's eyes.

THE BOY AND THE CIGARETTE: HOW BEST PRESENT THE EVILS OF SMOKING TO ADOLESCENT BOYS.

W. S. SMALL, PH. D., PRINCIPAL, EASTERN HIGH SCHOOL, WASHINGTON, D. C.

(Abstract.)

It is not to be expected that any presentation of the evils of smoking will be convincing to all boys. There are some who, even if the arguments do convince their heads, are yet ready to experiment with the danger. It has been my experience, however, that a good many boys may be appealed to by a sane and reasonable statement of the evils incident to smoking in early life. I believe that a considerable number of boys who otherwise would smoke, may be saved from smoking by frank and sincere discussion of the matter.

The first principle to be observed in talking with or to boys upon this subject is the avoidance of rambling and easily impeachable generalizations. All statements must be definite, clear-cut and scientific; all statements must be demonstrable by facts properly ascertained and properly arranged. Loose and extreme talk to boys about this subject is likely to increase the evil the prevention or abatement of which is aimed at. The high school principal who warned a six foot boy against smoking lest his growth be stunted did not see the humor of the situation; the boy, however, and his companions did see it. More than that, they had no further respect for the principal's opinions bearing upon that matter.

On the other hand, there are certain lines of evidence and argument that are easily understood by high school boys and that they listen to with interest and respect. I do not mean to suggest that the order as given below is the order of relative importance. In fact, no such order could be predicated for all boys. One line of argument appeals to one type of boy and another to another type. In my own experience all of the lines of argument indicated in the following have been effective with some boys.

1. The testimony of men who have wide experience and who have observed carefully will have weight with many boys, especially with boys who are somewhat thoughtful and whose smoking has been due to the suggestion of their comrades rather than to any special interest in or liking for the practice in itself. Furthermore, the weight of such testimony is greater if it comes from practical men of affairs.

As an example of such testimony may be cited the recommendation of Rear Admiral Seaton Schroeder, commander-in-chief of the Atlantic battleship fleet, to the secretary of the navy in 1909, that no cigarettes be sold at the ship's store on any of the vessels under his command. Admiral Schroeder's conclusion, from long and careful observation, is that cigarette smoking tends to impair the health of the men and tends in no way to increase their efficiency. Similarly, the statement of Judge Ben Lindsey that, in his ten years' experience with the juvenile court, during which time he has had to do with thousands and thousands of boys who have disgraced themselves and their parents and have brought sorrow and misery into their lives, he has "found no one habit that is responsible for more of the troubles of these boys than cigarette smoking." Or again the testimony of President Andrew White (9) of Cornell University: "I never knew a student to smoke cigarettes who did not disappoint expectations, or to use our expressive vernacular, 'kinder peter out.' I have watched this class of men for thirty years, and cannot recall an exception to this rule. Cigarette smoking serves not only to weaken a young man's body, but to undermine his will and weaken his ambition. In colleges having a large percentage of these futile personages they too often give the student tone; they set the fashion; the fashion of over-expenditure, of carelessness as to the real aim and glory of college life."

2. A second line of argument is the economic handicap incident to cigarette smoking. More and more the leaders in commerce and industry are putting a ban upon the smoker. Three indications of this are: (a) the fact that many railway and traction companies now refuse to employ excessive smokers, giving as the reason for this discrimination that such men are less efficient and are "more likely to lose nerve in an emergency than non-smokers"; (b) that many men engaged in commercial business make a rule of rejecting young applicants who smoke. For example the Y. M. C. A. of Washington publishes a list of thirty-four business houses in Washington, large and small, that refuse to employ boys and young men who habitually smoke cigarettes; (c) the fact that the best insurance companies reject excessive smokers upon the ground that vital statistics reveal a tendency to relatively short life among excessive smokers. The effectiveness of this form of argument is in direct ratio to the number of specific instances that can be adduced.

3. The æsthetic argument also has a place. The offensiveness of the cigarette smoker to non-smokers will appeal to some; and the disgusting odor and details of personal appearance characteristic of the cigarette fiend will appeal to others. This argument is presented with a good deal of force by Mr. W. H. Allen in his book entitled "Civics and Health." (4)

4. A more direct argument is the demonstration of the effect of smoking upon the psychophysical organism by statistical records. The Yale records cited by General Woodhull (7) show distinctly the inferiority of the smokers for a period of nine years in Yale College. The average entering age of the smokers was fifteen months higher than that of the non-smokers; the lung capacity of the smokers was 80 cu. cm. less and the height 7 mm. less than that of the non-smokers, in spite of the fact that by reason of greater age, the height and lung capacity should also be greater. At the end of four years the non-smokers had gained 24 per cent more in height and 26.7 per cent more in chest girth than the habitual smokers. Mr. Taylor's study of boys in a secondary school (6) shows clearly a relation between smoking and mental and physical development. His conclusion in regard to mental development is "that 'backward' boys in a class are almost always smokers, of course there are other habits among boys which tend to draw them to the bottom of the class, but in my experience boys possessing such habits are almost always smokers, though whether the smoking is the cause or merely an attendant phenomenon in such cases might be difficult to determine. Certain it is, however, that a boy's energy is bound to be more or less weakened by the constant use of a narcotic, so that we can easily believe that smoking may be the forerunner, if not the support, of other vices even more unpleasant."

As a result of careful physical measurements, Mr. Taylor finds the following results: (a) "Many of the older boys, who smoked when younger, are under normal size for their age, though I have also known many who have smoked continuously for some years, who are yet quite tall and broad; (b) these 'tall' smokers are likely to be more than dull mentally, while the little stunted fellows are generally quite bright; (c) smoking stunts 'something,' varying with the boy, with one stopping the growth, with another stunting his mind, and with yet another, stunting both growth and mind."

Bill Nye's retort when twitted with his baldness is not irrelevant in this connection: Some people are bald on the outside of their heads and others on the inside. It is a very dull boy who does not see the point.

5. In many of the school physiologies exaggerated emphasis is placed upon the pathological effects of nicotine. The deterrent effect upon boys of the knowledge of the pathological effects of nicotine has been relied upon oftentimes to the exclusion of such arguments as are suggested above. At the present time certain writers are going to the opposite extreme and are denying that such knowledge has any deterrent effect at all. This position is as unsound as the opposite extreme. A boy naturally desires to know why smoking is injurious and the explanation

must take the form of the statement of the physiological facts involved. Physiological explanations are futile only when the attempt is made to go beyond the physiological conceptions of schoolboys. Such explanations, if simply and scientifically made, carry weight with adolescent boys. Their normal interest in and desire for personal strength, skill and prowess furnishes the motive. Especially are such explanations effective if they spring incidentally out of the talks with boys relative to the results of their physical examinations.

BIBLIOGRAPHY.

1. H. D. Harvey: The Cigarette. *Journal of Education.* Vol. 65, pp. 485-87. May 2, 1907.
2. The Cigarette Boy. *Education.* Vol. 28, pp. 154-160. 1907.
3. Schoolboy Smokers. *American Education.* Vol. 11, p. 392. April, 1908.
4. W. H. Allen: Civics and Health. Ch. XXXVI.
5. G. W. Fitz: Physiology and Hygiene. p. 320.
6. Charles Keen Taylor: The Boy and the Cigarette. *Psychol. Clinic,* IV. 2. April 15, 1910.
7. Alfred A. Woodhull: Cigarette Smoking by the Young. *American Health.* Vol. 1, No. 4, pp. 37-40. Sept., 1908.
8. Gulick's Series of School Physiologies. *In locis.*
9. Andrew D. White in *Cornell Sun.* Nov. 11, 1891.
10. George L. Meylan: The Effects of Smoking Upon College Students. *Pop. Sci. Mo.* Aug., 1910.

THE WORK OF THE PUBLIC HEALTH EDUCATION COMMITTEE OF THE AMERICAN MEDICAL ASSOCIATION.

ROSALIE SLAUGHTER MORTON, M. D., CHAIRMAN.

Mr. President, fellow members and guests of the American School Hygiene Association: I have been asked to speak to you of the work of the American Medical Association Public Health Education Committee.

This committee was formed in July, 1909, in accordance with the terms of a resolution passed unanimously, first by the American Medical Association Section on Health and Preventive Medicine, and then unanimously by the House of Delegates of the American Medical Association.

Work was organized in forty states and the District of Columbia, and begun in Alaska, Panama, Hawaii and the Philippines, the plan being in the United States to establish in as many counties as possible, definite work for the education of the people regarding the causes and prevention of disease, enlisting in this work the services of those who were members of their county medical

societies in order to have this instruction given by the best physicians in each locality, free from technicalities, or self-advertising, and under the auspices of the most dignified, representative body in each community with the sole purpose of doing good by lessening suffering and saving life.

In reviewing the great movements of the day it will be found that they are all educational or philanthropic, and so ready were physicians to do their part toward making practical the altruistic spirit of the time, and so eager are the public for instruction which leads to the upbuilding of health, that in one year 2250 gratuitous lectures were given to audiences aggregating approximately 200,000 people. The topics presented were as follows:

1. The cause and prevention of ordinary colds, bronchitis, etc.
2. The value of pure food and the physiology of digestion.
3. Food, its relation to intellectual and physical development.
4. The relation of clean streets to public health.
5. The water-borne diseases and the relation of pure water to public health.
6. Hygiene of public conveyances.
7. The value of exercise and rest to public health.
8. Diseases induced by certain industries.
9. The causes and prevention of nervous exhaustion and prostration.
10. The mental hygiene of rest, occupation and emotion.
11. The use and abuse of stimulants and narcotics.
12. The prevention and cure of tuberculosis.
13. The air we breathe and the value of ventilation.
14. Bacteria helpful and harmful.
15. The relation of flies, mosquitoes, water bugs and other insects to public health.
16. Pure milk and infant hygiene.
17. Child hygiene in relation to the home, the school, the playground and child-labor.
18. The hygienic care and management of nervous children.
19. The importance of medical inspection in our schools.
20. The relation of dental hygiene to good health.
21. Prevention of some of the commoner skin diseases.
22. The importance of early diagnosis and treatment of adenoids.
23. The causes and prevention of deafness.
24. The prevention of Fourth of July injuries and tetanus.
25. Habit postures good and bad.
26. The causes and prevention of blindness.
27. The causes and results of eyestrain.
28. The causes and prevention of rheumatism, gout, appendicitis and Bright's disease.
29. The care of the sick at home.
30. How to meet emergencies, hemorrhages, burns, etc.
31. How to instruct children regarding the origin of life.
32. The responsibility of girlhood to motherhood in the care of the health during the menstrual period.
33. Pregnancy and the menopause.
34. The value of early diagnosis of cancer in women.
35. The responsibility of boyhood to fatherhood.
36. Social hygiene—how parents may protect their sons and daughters from immorality.

Etc., etc. Other topics which may arise concerning public health.

All the topics in which public education can raise the standards of health were presented because 1500 physicians took part in the work, and the list of topics was arranged with a view to each physician's selecting the subject he or she felt most important to bring to the attention of the public.

The audiences were members of women's clubs, mothers' and teachers' organizations, Young Women's Christian Associations, church and social settlement clubs, etc., bodies of earnest women fitted to carry the instruction to ever widening circles and put it into practice in a way to be of great health value. In a number of places, as in New York, a series of lectures was given in a central locality with a program of subjects arranged to follow in especial sequence. Beside these throughout the city many separate lectures were given in different languages to small groups. The amount of work to be done is so great that one of the most encouraging results has been that many others are now following the same plan and lately in this city, Dr. Antonio Stella, one of our most public-spirited scientists, has arranged a similar course to be given in Italian to an Italian public, under the auspices of the Italian Medical Society.

Of course there is nothing new in the idea of educating the public along this line, and many physcians have individually for years and in small groups, or as members of organizations made up largely of members of the laity, rendered this unselfish form of service; but the Public Health Education Committee, which now forms part of the American Medical Association Council on Health and Public Instruction, and whose work this year extends through forty-six states, and is growing in all directions, is unprecedented here, or abroad, in that it is the first time in the history of the world that physicians as a whole have taken up such work, under the auspices of a national organization of physicians, and I may say that no one person has been of greater inspiration or practical help in the development of this work than Dr. Luther H. Gulick, president of the American School Hygiene Association. The future of our committee's work lies very closely in touch with the future of school hygiene, for as a physician, who has lectured on applied physiology in six private schools, I know of no subject so generally neglected, or so greatly needed, as practical instruction on the cause and prevention of disease. If such teaching were as much part of the curriculum of every school as mathematics now is (and it is far more important than even mathematics) we would have raised a standard of health among the citizens of the United States, present and future, that would go further toward the best building of our nation than any movement of the day not based on health. Spencer wisely said: "It is the first duty of the individual to learn how to live." So strongly do I believe that ill health is the main cause of crime,

misery and poverty that I believe it is the first duty of all citizens to work for the health of the community. At present 19,000 children in the United States leave school yearly at or about the age of fourteen and know absolutely nothing of practical physiology.

Dr. Frances Bradley of Atlanta, our state secretary for Georgia, has so brought the importance of this to the attention of the governor of her state that he has promised to set aside a day which shall be known as Health Day throughout the state, and the commission of education has promised that this day shall be observed by every school in the state. This is a step in the right direction, and I wish by coöperation with the American School Hygiene Association we might have a similar ordinance in every state in the Union, and that, instead of one day there might be in each public and private school in the United States a series of lectures on such topics as:

1. The cause and prevention of ordinary colds.
2. The value of exercise and rest.
3. Habit postures, good and bad.
4. The physiology of digestion.
5. The responsibility of girlhood to motherhood or the responsibility of boyhood to fatherhood.

It would of course be Utopian to suppose this could be accomplished through our committee. It could only be done by cooperation of all the many organizations now working along health lines and led by the American School Hygiene Association; but as one of your own members I urge that some step of this nature may be taken as a result of this congress, for I know by practical experience that such subjects may be presented to, and will be understood by, children from eight to eighteen years of age. Other subjects may be added, but these five cover the essentials and may be made to cover the health and important functions of the respiratory, nervous, muscular, digestive and reproductive systems and emphasize some of the things for which the American School Hygiene Association stands, i.e. proper ventilation, playgrounds, proper desks and seating, etc. It is my belief that the series should be given in a single school by a single lecturer and not oftener than one week apart. This causes the pupils and lecturer to feel at home with each other and leads up to the presentation of the delicate, and otherwise difficult, subject of the care of the health at the menstrual period and the relation of girlhood to motherhood; and no one knows better than a woman physician how greatly this teaching, rightly given, is needed in every school, and how pitifully anxious the pupils are for it, as is shown by the depth of ignorance and misinformation in written questions when pupils are permitted to deposit them unsigned in a question box.

One of our state secretaries writes, "the little towns are clamoring for help." We as physicians are giving all the time out of our busy lives that we can take from the needs of the acutely ill, and we deem it a privilege to be present at this congress, which brings together so many people of varied experience and kindred minds, and we trust that as a result of this congress ways may be evolved for the best methods of using our united services for the good of humanity, which is the ideal which lies so close to all our hearts.

THE SANATORIUM SCHOOL.

HENRY BARTON JACOBS, M. D., SECRETARY, NATIONAL ASSOCIATION FOR THE STUDY AND PREVENTION OF TUBERCULOSIS, BALTIMORE, MD.

I want to bring before this congress a line of school work valuable both from the point of view of hygiene and from that of education, the two chief interests, I take it, of the Association organizing this meeting, and the reason I would have you consider the subject I present is that I feel this body may become influential in extending and encouraging a movement which as yet is but begun.

The sanatorium school, in the sense in which I mean to use the words, is a school for children suffering with tuberculosis, conducted within the sanatorium where they are admitted for the cure of their disease. It contemplates three very important facts:

1. That in all our larger communities there are children of the school age infected with tuberculosis in a curable form requiring sanatorium treatment, a fact which I shall not attempt to demonstrate anew.

2. That there are sanatoria into which these children may be admitted for treatment.

Unfortunately our states have been very slow in appreciating the necessity and value of sanatoria for children. France, on the other hand, has long considered it a vital part of the problem of suppressing tuberculosis. We have built sanatoria largely for adults; they have built largely for children.

If tuberculosis is to be controlled or eventually eradicated it will be through the coming rather than through the passing generation.

3. The third fact contemplated by the sanatorium school is that while undergoing treatment the children's studies are continued. This is extremely important, for in the first place the

patients at public or semi-public sanatoria are largely from the working classes, and the children of these classes are allowed at best but few years of school life, and if a portion of this life is to be lost in a sanatorium, say six months or a year, at the period when it is most valuable, the loss will be serious.

More than this, the principles of the prevention of tuberculosis and the best manner of living can nowhere be taught more effectively than in sanatoria; indeed such institutions well conducted are really normal schools, the graduates from which become active teachers in the methods of correct living when they return to their homes, and so it is that children become the most hopeful pupils, because their minds are so active and receptive, and the habits formed in their early years are the habits which are most likely to persist after the reason for their formation has long been forgotten.

The sanatorium school does not in any respect supplant the open-air school of the general school system. The need for this open-air school, or perhaps better, the open-air room in each large school building is beyond question. This is to receive the anæmic, debilitated, sub-normal children, the so-called *pretuberculous* and possibly also the *mildly infected* tuberculous children.

The sanatorium and hence the sanatorium school is for *distinctly tuberculous* children where the importance of rest, good food and careful medical oversight is urgent, and furthermore, in the absence of the open-air school, or the open-air room in the general school system, *pretuberculous children* should also be sent to the sanatorium, where it will be found they make wonderful progress to health, the gain in weight sometimes being almost incredible.

The exact number of tuberculous children in any given community cannot be known until very active efforts are made through school inspectors, school nurses, and particularly through visiting tuberculosis nurses. Then it will be discovered that the number of such school children far exceeds the general expectation, and to meet the requirements for their proper care and treatment, increased sanatorium facilities for children must be provided everywhere, nor should these sanatorium facilities be limited to the medical cases of tuberculosis but should be open as well to the surgical cases, a large preponderance of which exist in childhood and are as amenable to sanatorium treatment as medical tuberculosis, and the ratio of permanent cures much higher.

To illustrate the lack of provision made for children suffering with tuberculosis, I may quote the conditions prevailing in Maryland, a state equipped for the care of adult cases far above the average in the country.

In Maryland there is no single institution devoted exclusively to the care of all forms of tuberculosis in children. A number of institutions take in cases of surgical tuberculosis, and both the Eudowood Sanatorium and the State Sanatorium receive a limited number of children with pulmonary or other forms of so-called medical tuberculosis in a curable form. At Eudowood special attention has been given to children, proven to be infected either by physical examination or by use of tuberculin, taken from families from which at least one member was under treatment in the sanatorium, and here, first under the guidance of Miss Whitney, the superintendent of nurses, suggested by the resident physician, Dr. Forster, these children were gathered into classes to form a sanatorium school. Application was made to the various boards of education of the county, city or state, but it was found that no law existed which would permit any one of the boards granting school books to this newly organized school, and so a benevolent individual volunteered to supply the necessary text books. The school though small was decidedly successful and continued until its organizers left the sanatorium for work in another state.

Within the past year the Maryland State Sanatorium, designed for adult tuberculosis in a curable form, has been taking in a number of cases of children in a hopeful condition until now there are thirty-one children under treatment and all are attending the school sanatorium, fourteen boys and seventeen girls. These children are naturally of all ages within the school age limits and so belong to no one grade and must be taught as were the children in the old district schools of New England. The superintendent of the sanatorium, Dr. Cullen, and the superintendent of nurses, Miss Lassen, should receive credit for organizing the school. The teaching force is found in two young women, formerly teachers in public schools in the state, who, themselves patients undergoing treatment, are well enough to undertake the work, and being very much interested in the welfare of children are glad of this occupation. They are both very competent and were well thought of in the community where they formerly taught. The sanatorium itself has provided the text books as they could not be furnished through the state school system.

The sitting room of one of the open-air pavilions has been converted into a schoolroom, and here with windows wide open the school meets daily from nine to twelve. In the evening after supper assisted by the nurse in charge the children study for one hour.

The superintendent writes to me that the teachers report to him that the children usually know their lessons very well, and all of them seem to take an interest in the school. He writes

farther: "My opinion is that this instruction is very valuable, as you realize it is the hardest thing in the world to keep children still under the best conditions, and while they are having school they are kept still. It gives them something to think about, and there is a spirit of rivalry among them, much more than one would expect." More than this the mingling of children with adults in the population of a sanatorium seems to me extremely beneficial, the former have the controlling influence of the latter, and the latter have the diverting and stimulating influence of the former. No family is so happy and content as that in which children abound and so the same may probably be true of the larger sanatorium family.

The presence of the school, the mild rivalry which must follow among the pupils becomes an object of great interest to the older patients and may incite them to books and reading which will help to pass many an hour otherwise long and weary.

There are in this country a few other sanatorium schools outside of Maryland. The best perhaps is that at Stony Wold at Lake Kushaqua, New York, where a special school building equipped with desks and the necessary school appurtenances has been erected. It is practically an open-air school, as we now understand that term.

At Bedford Station, New York, in the Montefiore County Sanatorium, Dr. Rosenberg's wife conducts a small school. At the New Jersey State Sanatorium at Glen Gardner the township is compelled to employ a teacher for the children admitted to the sanatorium, the state demanding that each township and county must educate the children in that county whether residing there either temporarily or permanently.

The same is true at the Tuberculosis Preventorium for children at Farmingdale, New Jersey. Instruction is also given in the Pittsburg Sanatorium, Pittsburg, Pa., and in the Otisville Sanatorium, Otisville, New York. These are practically, so far as I know, the only institutions in which cases of medical tuberculosis are received that school instruction is given, though in hospitals for surgical tuberculosis, such as the Sea Breeze Hospital at Coney Island, the New York Hospital for Crippled and Deformed Children, and the Hospital School for Children, Baltimore, courses of study for the little patients have been established.

In reference to this subject Dr. Farrand of the National Association for the Study and Prevention of Tuberculosis writes as follows:

"I am sorry to say that we have not a complete record of the provision for school instruction to children in sanatoria. Such information as we have has been gathered incidentally and not as the result of a systematic inquiry.

"Of course there are comparatively few sanatoria that admit children in any number. I suppose, therefore, that provision for instruction is rather meager and incidental except in the few places named.

"I know that in certain cases where there may be one or two children in a sanatorium, such temporary provision for their instruction by other patients as may be possible is made, but it could hardly be dignified by the term regular instruction."

My plea to the members of this congress is that they use their influence:

1. To increase sanatorium facilities for tuberculous children everywhere in this country.
2. To encourage school classes in all sanatoria where there are under treatment at least five children of school age, provided their physical condition is suitable to such instruction.
3. To urge school authorities, either local or state, to become interested in these sanatorium schools and to provide them with text books and other necessary school apparatus.

Papers Presented Friday Evening, February 3.

THE CONSECRATION OF THE AFFECTIONS (OFTEN MISNAMED SEX-HYGIENE).

RICHARD C. CABOT, M. D., BOSTON, ASSISTANT PROFESSOR OF CLINICAL MEDICINE, HARVARD UNIVERSITY.

The subject which I have called (and I believe rightly) the "Consecration of the Affections," is frequently though improperly called "Sex-Hygiene." Within the last year I have had occasion to talk with doctors, ministers, educators, social workers and parents in various parts of this country. Everywhere I found thoughtful people much aroused upon this subject, usually in its misstated form of "Sex-Hygiene."

Until recently there has been a "conspiracy of silence" regarding the venereal diseases and the perverted, the diseased aspect of the affections. That conspiracy of silence is, however, now broken. About once a week one can read a new book in which that silence is loudly broken. But it is broken in terms that seem to me to spell disaster. There is, I think, great need of guidance just now from men and women who recognize the normal as well as the abnormal aspects of affection. A half truth, a quarter truth, an eighth truth of the type that is being published now under various titles as "*the* plain facts," or "*the* naked facts," about sex and sex diseases does, in my opinion, a vast deal of harm.

I will take up the popular wording of this topic, involving the fallacy which seems so well to define the negative aspect of my theme. Sex-hygiene we call it! But in fact this subject has nothing to do with hygiene. I say this as one whose chief work in life is to promote hygiene. The straight, right action in matters of human affection has nothing to do with hygiene. For hygiene has no words to proclaim as to why you and I should behave ourselves. Hygiene has the right and the duty to make clear the perverted and the diseased consequences of certain errors. But these consequences are far from constant. The first thing we have to get before our minds is that sex disease is a matter of chance and not a matter of consequence. There are a vast number of people who, though guilty of sinning, have been rich enough or ingenious enough or lucky enough to remain entirely free from any manifestation of disease, while on the other hand many

absolutely innocent people are diseased. There are cases of disease from self-indulgence in the field of the affections; but there may be precisely the same sin without any disease. Let us disabuse our minds, then, of the idea that there are always bad physical consequences of mistake, error, or sin in this field, and that those consequences are reasons for behaving ourselves.

But even if there were always such consequences, I think it even more mischievous for us to preach a morality based upon them. The man of science, the professor of hygiene, may say that you ought to behave yourself because if you don't do so these physical results will follow. But in the first place it is not always true, and in the second place it is very bad morality. If it were true it still would be wrong to say it in that way. If we should say, "Don't steal, because if you do you will get caught," I trust that objection would at once be raised, though I fear that this kind of "morality" is altogether too rife in this country.

I attended recently a meeting of young Jewish professional men. I was the only Gentile in the assembly. I had been talking of preventive medicine. The majority of the company were lawyers and one of them began to prophesy about "preventive law." In the course of discussion an assistant district attorney in the county where Boston is located told us some of his experiences in the office of the district attorney. Among other things he said: "It sometimes seems to me that we are not living in a moral age at all. When I was young I was taught to believe that all sin was against God. 'Against Thee, Thee only have I sinned.' But nowadays the principle seems to be that if you get caught the thing is wrong; if you don't it's all right."

Now I say that the preaching about sex hygiene that is going on in recent books and in the periodical press is immoral in its tendency. It is like saying, "Don't lie, for if you do, you won't sleep at night and insomnia is bad for the health." But there are people who do lie and who don't lie awake at night. Or it is as if we should say, "Don't steal, for you may be caught, and prisons are unhygienic." Is that the true reason?

I have chosen to speak of the affections rather than of their supposed physical basis in *sex,* for, if any reform is to come to us, it must begin with a comprehension of the words which we use. We have gone clear out of all logic in these matters by reason of the physical metaphors grouped around the word "*basis.*"

We speak of many things having a physical "basis" and there around that word we perform one of those logical pivotings which are so disastrous. The word basis means the bottom or support of anything. But by a dangerous metaphor we also use it to mean *fundamental,* which is an entirely different thing because it implies that it is the most *important* element. Thus we generally use the term "basis" not as that which happens to be at the

bottom, but as "the root of the matter," the essential element out of which all the other less important things grow. In that way we get into the most harmful kind of error. In a house the basis is the foundation, the bottom; yet we would scarcely say that the most interesting thing about the house, the most essential, is the cellar. No more would we say that the most important part of a man is his feet because they happen to be the foundation—the bottom—which supports him.

It seems to me worth while then to reflect a bit on this aspect of the phrase, "a physical basis." If we define "a physical basis" as one element, we are still within our logic. When we use it metaphorically as the central meaning or the essence of anything, then we get into all sorts of absurdities.

If what I have said so far is true, how does it come that a large majority of people have come to think of the consecration of affection from the point of view of a "physical basis" and a false idea of hygiene? I believe that the answer is: First, because we Americans are born in a hurry and never get over it; and secondly, because we hate to think. The easiest way to explain this mystery of the affections is to call it hygiene. We seem then to have found the cause of our troubles and we must have a remedy at once. In the teaching of hygiene we have an easy and quick (i.e. a physical) remedy. The problem how to consecrate affection is the one which is presenting itself in American life to-day. Physical explanations or solutions are by far the easiest, and the easiest is the quickest, saves time and saves labor. We are in a hurry. So we say, in our headlong American fashion, "Something must be done and done quickly." But the only thing that can be done quickly and easily and impressively is to teach hygiene. Hence our mistake, a very common one in modern sociology.

We read that certain criminologists have by long study and examination found what they consider to be definite physical evidence of a *criminal build,* certain abnormalities of skull, ears, palate, etc., and that the main thing to do is to study the physical man if you wish to determine his guilt and plan his treatment. It matters not that every prison official with long experience in caring for criminals says that this is not so, and that these supposed "stigmata" are not characteristic. Never mind. We must have some explanation, easy and quick, and therefore seize upon the physical conception of criminology.

The problem of the backward child is brought before us; we face a great spiritual puzzle and we solve it in the same hurried manner. We say: "Cut out the child's adenoids and the trouble will cease." Now and then that is true. Sometimes the child is brighter and better after the adenoid operation. But it is *always* easier to cut out the tonsils than to face the whole problem

of why that child is backward and what are the circumstances leading up to his condition at this moment; so we send for the doctor, have the operation done and feel relieved. But in many, many cases the backward child is there just the same, and will be there until we recognize the spiritual problem of his individuality. The average child responds to average methods of teaching and those methods come to be accepted as standard. But there are others who are intelligent, yet cannot learn by the regular methods suited to the majority. These special children need special study and special ingenuity, and we shrink from the task. It is much easier to say that they have adenoids.

You have all heard the unending discussions between the socialist and the social workers about the cause of alcoholism. I am never near such an argument long without hearing these two remarks:

The socialist: "People drink and alcoholism exists because they are poor and miserable."

The charity worker (who is closer to the facts of family misery): "People are poor because they drink. If men did not spend their money in drinking, if they didn't drain their savings and lose their jobs and spoil their nerves, they wouldn't be poor." One says that poverty is due to drink, the other that drink is due to poverty. After hearing each argument I find myself in opposition to both. Both try to explain the facts on "a physical basis," and both try to apply a physical remedy. Both therefore are superficial. Any one who is close to these subjects will tell you that alcoholism and poverty are not symptoms of each other but are the results of a common cause—discouragement. Somehow people get to a point of discouragement where they don't care to work and save and where they are the prey to drink. They don't care enough about life or home or themselves to make an effort. Then it is that they get to the misery of poverty—not that poverty in which many folks are so happy, but the kind which weighs down what we call the "submerged tenth."

I need not go into further exemplification of this modern and very unscientific habit of mind. It is due to a simple economy of mental effort. We shirk the burden of solving our problems and reach out after a panacea, a physical explanation, a physical cure-all. *These are labor-saving devices.* But labor must sometimes be faced, not shirked or saved.

Yet we cannot blame people much for this shirking habit. They must somehow keep up their courage in the face of terrible problems. If one has no explanation for such things, if one has not the deeper source of courage, I mean religion, he must get something else to buoy himself up with. Almost the only alternative in sight is a physical explanation with its satellite, a physical remedy.

The attempts to consecrate affection and to safeguard morality by teaching in public or private schools what is called "sex hygiene" will, I believe, prove a failure. I have very little confidence in the restraining or inspiring value of information, as such. I have seen too much of its powerlessness in medical men and students. No one knows so much of the harm of morphine as the physicians do, yet there are more cases of morphine habit among physicians than among any less informed profession. It is easy, of course, to make young children familiar with the facts of maternity and birth. Compared to the ordinary methods of concealment and lying by parents to children about these matters this is doubtless an improvement, but it does almost nothing to meet the moral problems of sex which come up later in the child's life. *One may know all about maternity, without knowing anything of the difficulties and dangers of sex.*

Many have thought that by thorough teaching of the physiology of reproduction in plants and animals we can anticipate and to a considerable extent prevent the dangers and temptations referred to above. But two points should be noticed in this connection: first, that there is nothing about Nature that should make us look up to her as a source of good example in this field. The behavior of most of the insects and animals that we see about us is as far as possible from being a model for human beings in the relations of sex. All that we can get from nature here is an awful warning as to the depths to which we might conceivably fall. The promiscuous and temporary character of the relations observable among most of the animals which we see about us in civilized life is precisely what we want to avoid in the relations of men and women. Why, then, should we teach it as part of an education in the consecration of affection?

It is true that we may point out here and there beautiful examples of maternal, and even of paternal tenderness and self-sacrifice among animals in their relations to their young. Here and there we may also point to a comparatively stable union between the male and female of one or another animal species. But in both of these cases what we are doing is to select among animals certain features in which they are almost as admirable as man. How much simpler and truer it would be to confine ourselves to human example. There is nothing scientific about selecting here and there from the animal kingdom such examples of behavior as happen to suit our purpose.

Turning now to the more positive aspects of our subject, I should say that in the morals of sex *Immunity* and *Vitality* are the great watchwords. The positive moral qualities which make us immune to the dangers clustering about sex, the heightened vitality, the more abundant life which enables us to live above such temptations, are obtainable not through warnings as to dan-

gers, not through an appeal to prudential motives and the saving of our own skins, but through the more positive activities just alluded to. All that is most practical and successful in this field of endeavor may be summarized as the *contagion of personality, human or divine.* What is it that keeps any of us straight, unless it is the contagion of the highest personalities whom we have known, in man and God? Any one who wants to keep a college student within the path of decency will desire above all things for him the companionship and so far as may be the intimate friendship of pure women. Those who are familiar with the best novel written in the past decade, Miss Sinclair's "Divine Fire," will recall how the poor little Cockney journalist, depicted in the early chapters as a rather profligate and rudderless character, finds his bearings and deserts his mistaken ways of a sudden, not because he has been warned of the dangers of venereal disease, but because he has come to know a woman, the very thought of whom makes him abhor and shun his former practices and associates.

As soon as we face the problem from this point of view we see that it is utterly untrue to state that nothing has already been done in the field of education of the affections. All that the best school teachers and parents have done through the contagion of personality, though not a word may have been said about sex, has been effective nevertheless, and furnishes a basis on which we may build securely in the future. There is no sense in disregarding all that has preceded our present crusade. We must give due credit to what has already been done, and then, if we can, go beyond it.

Just what shall be taught, at what age, by what persons, and through what methods, I do not feel competent to say. I do not believe that a physician's or a biologist's training fits one to answer such a question, though many physicians and some nurses have been answering it at length in print. *Our problem is one of the feeding of young minds.* The educator, not the physician, is the person to guide us in this field. The doctor would be rightly indignant if the teacher were to assume the right to prescribe how the bodies of children should be fed and nourished. It is just as presumptuous for any of us physicians to undertake to prescribe for the nutrition and growth of young minds in matters pertaining to sex or any other matter. We have our place in relation to such education. We can supply some of the needful facts, but plans and details should be worked out by a conference in which educators and social workers shall wield the laboring oars, while physicians may give valuable aid as consulting experts.

But though I cannot forecast in any detail the result of the deliberations of such conferences as are sure to be held all over this country within the coming year, of one thing I feel quite

sure, namely, that a positive evil can be driven out only by a much more positive good. The lower passion can be conquered only by a higher passion, as was above exemplified in the case of Miss Sinclair's novel. Our problem then is one of the *transformation of vital energy,* and in these terms I believe it can be solved.

WHAT OUR CITY SCHOOLS ARE DOING FOR THE HEALTH OF OUR CHILDREN.

LUTHER H. GULICK, M. D., DIRECTOR OF DEPARTMENT OF CHILD HYGIENE, RUSSELL SAGE FOUNDATION, NEW YORK CITY.*

At the meeting of this Association held one year ago in Indianapolis, reports were presented on the status of instruction in hygiene in colleges and universities, and in physical education in the normal and secondary schools of the country. Moreover, we have had each year reports on the status of medical inspection of school children throughout the United States.

During the past few months I have been conducting an investigation into the measures now being taken by the cities of this country to safeguard the health of their school children along lines not covered in any of these reports. I have chosen as the field for this investigation what might roughly be termed the housekeeping of our public schools. That is, I have endeavored to find out, for the principal cities of America, the facts about the provision made for securing for children pure drinking water, clean schoolhouses, dust-free air, proper furniture and frequent recesses.

The data regarding the status of medical inspection throughout America, which will be presented by Dr. J. J. Cronin and the following findings concerning the other aspects of health provision for school children, refer to exactly the same territory and have been secured from the same localities.

The data secured fall under three headings: cleanliness, schoolroom fatigue, and health instruction. The topics and questions under which the information has been gathered under each of these three headings are the following:

---

*The statistical data in this report and the charts illustrating the findings were prepared by my associate, Dr. Leonard P. Ayres.
This report aims to show in a concrete way what the facts are with reference to the care of the health and vitality of children in the schools of the United States.

I. *Cleanliness and Light.*

1. How often are classroom floors swept?
2. How often are classroom floors washed?
3. Are dust-absorbing compounds used for sweeping?
4. Are moist cloths used for dusting?
5. How many schools have vacuum cleaning outfits?
6. How often are classroom windows washed?
7. How many school have sanitary drinking fountains?
8. How many schools are supplied with individual drinking cups?

II. *Classroom Fatigue.*

1. Do elementary children have regular outdoor recesses?
2. Are recesses given in all elementary grades?
3. Are adjustable desks in general use?
4. How often are they adjusted?

III. *Health Instruction.*

1. Do pupils receive special instruction on alcohol and tobacco?
2. Do pupils receive special instruction on tuberculosis?
3. Do pupils receive special instruction on first aid to the injured?

Both sets of data were secured through the same questionnaire, which was sent to the superintendents of schools of the 1285 cities in this country having organized school systems under superintendents. The number of cities replying was 758, distributed among the several divisions of states as follows:

Division	Cities Reporting
North Atlantic	308
South Atlantic	45
South Central	67
North Central	286
Western	52
United States	758

1. Cleanliness and light.

There are two important factors with respect to the cleaning of floors, as with respect to the cleaning of almost anything else. The first is *how it is done;* and the second is *how frequently it is done.* The reports of the cities concerning the frequency with which they sweep their classroom floors show, as was quite to be expected, that most of them do so every day; but this is by no means universal. More than 150 cities report that the classroom floors in their schools are swept less frequently. The exact data follow:

NUMBER OF CITIES WHERE CLASSROOM FLOORS ARE SWEPT WITH FREQUENCY INDICATED.

Daily	574
Once in two days	49
Once in three days	86
Weekly	6
Once in two weeks	2
Monthly	2
Once in two months	1
Once in five months	2
As needed	10
Not reporting	26
Total	758

Much less uniformity is found in the housekeeping practice of cities with respect to washing their classroom floors. The variation in this regard is great, ranging from conditions in the schools of one "Spotless Town," where they are washed each day, up to the confession from 44 cities at the other extreme of the scale that their schoolroom floors are not washed at all. The detailed figures follow:

NUMBER OF CITIES WHERE SCHOOLROOM FLOORS ARE WASHED WITH FREQUENCY INDICATED.

Daily	1
Once in two days	1
Once in three days	3
Weekly	36
Once in two weeks	27
Once in three weeks	8
Monthly	135
Once in two months	50
Once in three months	140
Once in five months	115
Once a year	57
As needed	68
Never	44
Not reporting	73
Total	758

This table seems to indicate that the commonest practice sanctions the washing of schoolroom floors once a month or once in three months, but that it is by no means rare to find cities in which they are washed once in five months or never washed at all.

There is ample evidence in the returns, that cities in general are waking up to the necessity for paying more attention to sweeping, dusting, and cleaning the interiors of schoolrooms. Four hundred and sixty-two cities, or 61 per cent of those answering, report that moist cloths are used for dusting. If this means, as it seems to, that the death-distributing feather duster has been banished in over 400 cities, it is an important and significant fact. Even greater advance has been made in the

use of dust-absorbing compounds for sweeping. Six hundred and forty-four cities, or 85 per cent of all, report that they are using these compounds.

A still further point of progress is reached by the 69 cities which report that they have installed vacuum cleaning systems in their schoolhouses. As the vacuum cleaner is of very recent development, this is an encouraging showing.

Another subject for investigation was the frequency with which classroom windows are washed. It has been frequently and conclusively demonstrated that even a small amount of dirt on window-glass greatly reduces the amount of light passing through—a fact which renders of especial importance the data concerning window cleaning. Here, again, there is the greatest variations in the practice of the different cities, one city reporting that the windows of its classrooms are washed each day, while five at the other end of the scale report that they are never washed at all. The data for all of the cities follow:

CITIES WHERE CLASSROOM WINDOWS ARE WASHED WITH FREQUENCY INDICATED.

Daily	1
Once in two days	1
Weekly	22
Once in two weeks	8
Once in three weeks	5
Monthly	117
Once in two months	84
Once in three months	139
Once in five months	111
Once a year	31
As needed	139
Never	5
Not reporting	95
Total	758

These figures seem to indicate that the commonest intervals between periods of window washing in most of our school systems are one month, three months and five months. It is noteworthy, too, that nearly a fifth of the cities report that they have no regular schedule for window washing, but clean them "as needed."

It is now about fifteen years since there swept across the country a wave of reform which replaced the common communion drinking cup in our churches with individual communion cups. Only recently have we begun to carry the same reform into our schools and public buildings, but once started the movement has gone forward so rapidly that now a great majority of all the cities are equipping their schools either with sanitary drinking fountains or with individual cups. Out of the 758 cities, 186 or 25 per cent have schools supplied with individual

drinking cups, and 571 or 75 per cent have introduced sanitary drinking fountains. These figures do not mean that all of the schools in every city have either one or the other of the new sanitary provisions. The data include many duplicates, for in a considerable number of cities the schools are equipped with both individual cups and sanitary fountains. On the other hand, some cities have not as yet introduced either the one or the other. Nevertheless, the figures do show that as a nation we are in a fair way to abolish the dangerous common tin dipper from our public schools.

2. Classroom fatigue.

Only two groups of facts have been gathered bearing on the general topic of classroom fatigue. These facts relate to recesses in the elementary grades, and the use of adjustable desks.

It is generally taken as a matter of course that the outdoor recess is part of the regular program in all elementary grades. The data gathered show that this is far from being the case, especially in the North Atlantic States. It is only in the South Central States that all of the cities report that outdoor recesses are regularly given in all elementary grades. The figures show that 49 cities in the North Atlantic division, 1 in the South Atlantic, 22 in the North Central, and 3 in the Western division do not have outdoor recesses throughout the elementary schools. This means that in these cities the children are compelled to remain in their classrooms and frequently to remain seated throughout the entire time of each session. The harmful effects of such continued and enforced inaction cannot be discussed here. The condition disclosed is so important as to warrant careful and extensive study.

Adjustable desks, which can be altered to fit the size of the pupils, are more common in the North Atlantic States than elsewhere. In the country as a whole, they are in use in practically one half of all the cities. The percentage of cities having their schools fitted with adjustable desks in each division of the country is as follows:

NUMBER AND PER CENT OF CITIES USING ADJUSTABLE DESKS.

Division	Cities having Adjustable Desks	Per cent having Adjustable Desks
North Atlantic	213	69
South Atlantic	12	27
South Central	18	27
North Central	92	32
Western	23	44
United States	358	47

These 358 cities report that their adjustable desks are adjusted with varying frequencies as follows:

CITIES ADJUSTING DESKS AT EACH INTERVAL NAMED.

Interval	Number of Cities
Daily	1
Once a month	3
Once in three months	14
Once in five months	12
Once a year	7
As needed	283
Never	1
Not reporting	37
Total	358

Here again the significant facts cannot be gathered without a special and somewhat searching study. Such a study in this case should aim to discover primarily just what conditions are really indicated by the figures which show that 283 cities adjust their adjustable desks "as needed."

3. Health Instruction.

The facts which have been received under the headings of "Cleanliness and Light" and "Classroom Fatigue," relate to the provisions taken by the school authorities for the protection of the individual pupils. Further figures have been gathered to discover what proportion of the cities are giving direct instruction in theoretical and applied hygiene. They have been asked to state how many and which ones are teaching their children about the effects of the use of alcohol and tobacco, how many are training them in the avoidance and cure of tuberculosis, and which ones are furnishing instruction in first aid to the injured.

The figures show that among the 758 cities, 717, or 95 per cent of them, are giving instruction in the effects of alcohol and tobacco. Special courses on the cure and prevention of tuberculosis are being given in 462 cities or 61 per cent of the whole number. Almost as many give instruction in first aid, the number of these cities being 430 or 57 per cent of all.

What is the deeper meaning of these facts and figures? Ten years ago the Proceedings of the National Education Association had one paragraph in one paper referring to health. In the last volume a large fraction of the space was given to this group of topics. This is just a straw which shows how the wind is blowing. Schools are to become, in fact are becoming, vitality-promoting instead of vitality-depleting agencies. The time is near at hand when all the children will gain in vitality, height, weight, and scholarship as do the few who are now in open-air classes. School will mean more power, more happiness, not the reverse.

Papers Presented Saturday Morning, February 4.

PROPER SANITATION OF THE SCHOOLROOM.

Among the many diseases known to be caused by the presence of harmful bacteria in the body are: Consumption, pneumonia, diphtheria, influenza (grip), whooping cough, chicken pox, tetanus (lockjaw), typhoid fever, and others. There is little doubt that scarlet fever and measles are caused by germs, although the bacteria which cause these diseases have not been discovered.

It is well known that the germs of most of the diseases mentioned will live for some time when dry, and that they are carried about in the air by means of floating particles of dust to which the germs cling. The germs renew their life and power to increase when they come into contact with soil favorable to their development, i.e., some part of the human body. It would seem reasonable, therefore, to suppose that the destruction of the dust and the clinging bacteria would do much to eradicate infectious diseases.

If a man-eating tiger should appear in an Indian community and take the life of a single human being, the whole community would be aroused, and there would be an organized pursuit for the brute which would terminate only when he was destroyed. If a poisonous plant growing in a field should cause the death of one of a herd of sheep, the owner of the sheep would uproot and destroy the plant at once, to save the rest of the herd. The laws of this and other states penalize farmers and property owners who allow noxious weeds to flourish either in their fields or along roadsides adjoining their property. The state protects, in other words, the useful products of the farm from the deleterious influence of noxious weeds. And yet, when it has been so conclusively shown that certain diseases are among us, which carry off prematurely a very large percentage of all who do not die from old age or accident, it is astonishing that such general indifference is shown to plans to pursue and eradicate the offending germs.

I have held for many years, with others who have studied the question, that the schoolroom is a center of infection for most diseases caused by bacteria. The time seems to have arrived

when officials, parents, teachers, and pupils should organize a grand hunt for the destroying bacteria, and our efforts should not cease until the last harmful germ has been removed from our midst. We must organize against ignorance, filth and laziness, no matter what the cost in dollars may be, to make the schoolroom the cleanest place in the community.

Some time ago I determined to attack the question of the health of the pupils in the school under me as it was affected by cleanliness—or lack of cleanliness—in the schoolroom. This question, considering its grave importance, has been ignored to a degree that may be called criminal, or the question has been left to the attention of the janitor, whose preparation has not been of such character as to fit him to handle the subject properly.

The schoolroom is occupied by the children, forty to sixty in a class, for five hours a day, and, when there are part-time classes, eight hours a day. In many cases, the rooms are occupied for two or more hours in the evening, and by vacation school pupils during the summer. Some schools have no rest, night or day, summer or winter, except on Saturdays and Sundays, and the problem for the janitor, who must often be at school by five o'clock in the morning, and remain at school until after ten at night, when evening school is dismissed, becomes a difficult one. That there is necessity for perfect cleanliness in the classrooms is quite obvious. The active coöperation, the intelligent coöperation of the janitor, must be secured if we are to succeed. It seems to me that it is, if possible, even more his duty than it is that of the teacher, to secure a perfect condition of the school as far as cleanliness goes. He should remember that his duties are threefold: namely, to keep the building warm, to keep the building properly ventilated, and to keep the building clean, *"and the greatest of these is cleanliness."*

To satisfy myself as to whether the ordinary contagious diseases of childhood were more or less prevalent when the schools are in session, I appealed to the board of health of New York City, and secured a statement showing the number of cases of measles, scarlet fever, and diphtheria, and the number of deaths from these diseases. The statement covers a period of more than twelve years, from the date of consolidation of the greater city, January 1, 1898, to July 1, 1910. Below are the figures arranged by quarters:

HEALTH STATISTICS—NEW YORK CITY.

[Since Consolidation, January 1, 1898, to July 1, 1910.]

By Quarters.

Date. Quarters.	Measles. No. of Cases	Measles. Deaths	Measles. Per Cent	Scarlet Fever. No. of Cases	Scarlet Fever. Deaths	Scarlet Fever. Per Cent	Diphtheria and Croup. No. of Cases	Diphtheria and Croup. Deaths	Diphtheria and Croup. Per Cent
1898									
1st Quarter.....	6921	268	3.9	3933	279	7.1	4009	623	15.6
2d "	5625	242	4.3	2750	245	9.	3042	472	15.5
3d "	1146	87	7.6	1066	87	8.2	1790	286	16.
4th "	1186	54	4.5	1334	92	6.9	2097	397	18.9
1899									
1st Quarter	2667	136	5.1	2316	191	8.2	2797	477	17.
2d "	4599	202	4.3½	2407	178	7.4	3066	491	16.
3d "	1697	116	6.8	955	62	6.5	2171	403	19.6
4th "	3571	133	3.7	1727	92	5.3	3628	553	15.2
1900									
1st Quarter.....	10496	390	3.7	2626	209	8.	4027	732	18.2
2d "	6944	289	4.16	1814	151	8.3	3521	623	17.7
3d "	1025	105	10.24	683	51	7.5	2061	358	17.3
4th "	834	32	3.8	1550	54	3.5	3304	554	16.8
1901									
1st Quarter.....	2317	63	2.7	5634	340	6.	3811	628	16.5
2d "	3982	123	3.1	7461	520	7.	3517	602	17.
3d "	1365	103	7.55	1470	158	10.65	1721	293	17.
4th "	4327	160	3.7	2147	144	6.7	3280	543	16.6
1902									
1st Quarter.....	10996	349	3.2	4199	356	8.5	4070	581	14.3
2d "	6613	243	3.7	4579	350	7.8	4074	564	13.8
3d "	1355	63	4.6½	1442	121	8.4	2716	347	12.8
4th "	1288	55	4.3	1674	113	6.7	4459	523	11.7
1903									
1st Quarter.....	2720	124	4.6	3357	215	6.1	4779	597	12.5
2d "	4662	176	3.8	3820	270	7.1	5194	623	12.
3d "	2312	105	4.5½	1311	108	8.2	3460	406	11.7
4th "	3995	103	2.6	2399	141	5.9	4884	564	11.5
1904									
1st Quarter.....	15010	293	1.95	5762	352	6.1	5356	623	11.8
2d "	15056	428	2.77	4383	298	6.8	5294	653	12.5
3d "	1632	92	5.64	995	58	5.8	3295	357	10.8
4th "	1151	80	6.95	2340	143	6.1	4047	444	11.
1905									
1st Quarter.....	3313	106	3.2	3268	220	6.7	3839	504	13.
2d "	8553	210	2.5	2543	148	5.4	3997	422	10.5
3d "	2690	111	4.1	671	33	4.9	2168	255	11.3
4th "	4470	93	2.1	1589	72	4.5	3682	363	9.9
1906									
1st Quarter.....	21668	506	2.3	2870	141	4.9	4937	693	12.
2d "	14211	480	3.4	2644	216	8.2	4243	528	12.4
3d "	1666	105	6.4	753	51	6.8	2168	252	11.1
4th "	1108	54	4.9	1614	83	5.1	3409	425	12.4
1907									
1st Quarter.....	3324	103	3.1	3778	188	5.2	3757	546	14.
2d "	6503	255	3.9	6252	297	4.8	4388	486	11.2
3d "	3316	210	6.3	2057	127	6.2	3127	325	10.4
4th "	3479	160	4.6	3701	184	5.	4054	383	9.4
1908									
1st Quarter.....	15505	380	2.4	10334	570	5.5	4974	612	12.3
2d "	18063	417	2.3	10069	562	5.6	4690	503	10.7
3d "	1992	86	4.3	1542	100	6.5	2430	264	10.9
4th "	2716	89	3.3	2481	101	4.1	4337	379	8.7
1909									
1st Quarter.....	8098	272	3.4	4630	269	5.8	4583	576	12.6
2d "	16835	439	2.6	3789	277	7.3	4017	496	12.3
3d "	3462	179	5.2	1021	80	7.8	2507	243	9.7
4th "	3559	97	2.7	3035	160	5.3	3990	399	10.
1910									
1st Quarter.....	15775	283	1.8	8138	459	5.6	4957	597	12.
2d "	15800	316	2.	7299	347	4.75	5674	561	9.9
Totals:	301,598	9,565	3.17	160,332	10,063	6.28	185,278	24,129	13.02

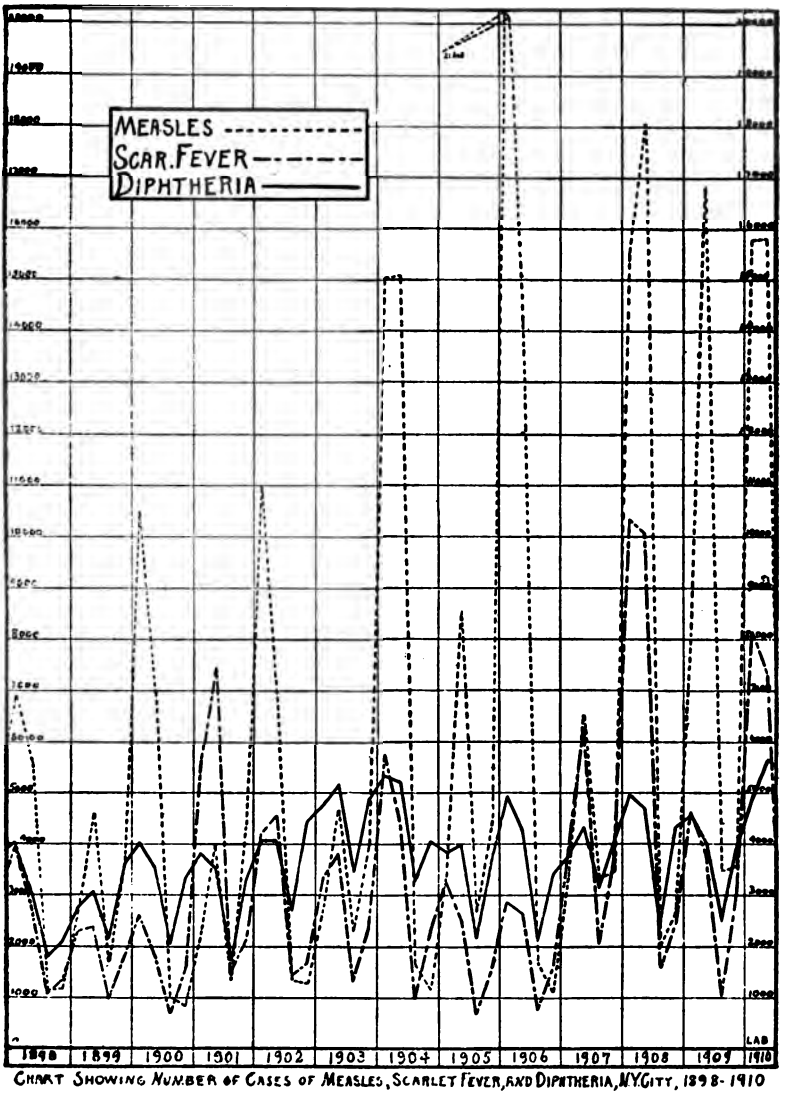


CHART SHOWING NUMBER OF CASES OF MEASLES, SCARLET FEVER, AND DIPHTHERIA, N.Y. CITY, 1898-1910

If these figures are charted, the result will show for *all* the diseases that there is an abrupt increase in the number of cases in the fall, after the schools open, and after the windows are closed—while just as abrupt a decrease in the number of cases occurs in the spring, and the drop continues to a minimum in September. The maximum occurs six months

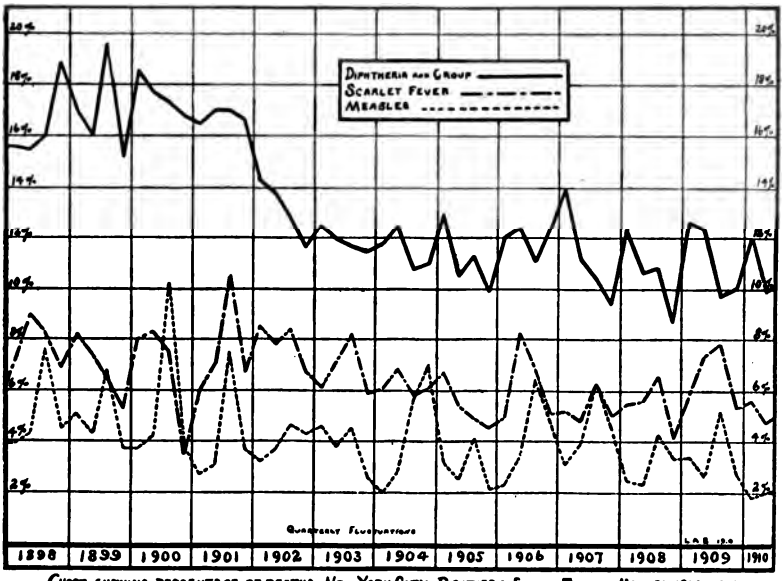


CHART SHOWING PERCENTAGE OF DEATHS, NEW YORK CITY,-DIPHTHERIA, SCARLET FEVER, AND MEASLES, 1898-1910.

later, in March. An examination of the figures and chart discloses the fact that a measles epidemic occurs in New York City every second year, the even numbered years; and it would seem that there is a scarlet fever epidemic every third year. Measles epidemics are very plainly shown on the chart for 1898, 1900, 1902, 1904, 1906, 1908, 1909, and 1910.

Epidemics of scarlet fever are plainly shown for the years 1898, 1901, 1904 and 1907, and very severe epidemics are shown to have occurred in 1908 and 1910.

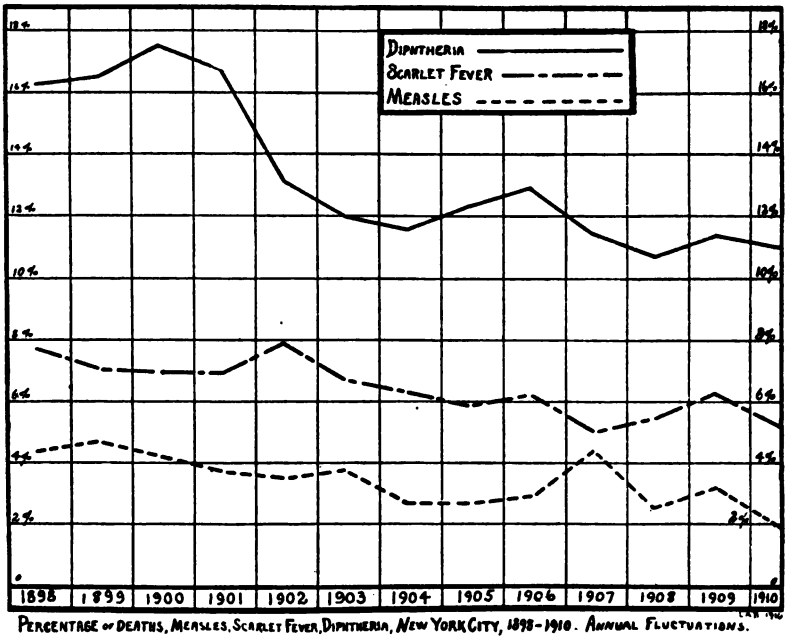
The regularity of the rise and fall in the number of cases, according to the season, is very evident, as shown by the chart, and the period of the summer vacation shows invariably the smallest number of cases. A study of the chart must convince anyone that there is a sudden increase in the number of contagious diseases among children at the opening of school in the fall, and it seems to be a very natural conclusion that the school must be a large factor in the increase—in other words, the school seems to be a great center for the spread of these diseases.

The following chart, also platted by quarters, shows the percentage of deaths from 1898 to July 1, 1910, in New York City, from the diseases, measles, scarlet fever, and diphtheria. During the early years of the greater city, 1898-1901, the death rate for diphtheria was between 16 and 20 per cent. After 1901 there was a sudden drop in the diphtheria death rate, and for the

last three or four years it has fluctuated between 10 and 12 per cent. The sudden drop was due to the discovery of the antitoxin of diphtheria and its use. Scarlet fever hovers between 4 and 7 per cent with a gradual drop in the rate since 1898. Measles hovers between 2 and 6 per cent. All show a gradual improvement. It will be noticed, if the two charts are compared, that the greatest percentage of deaths in diphtheria always occurs when there are epidemics of that disease, while in the case of measles and scarlet fever the percentage of deaths is almost always smaller during epidemics.

Some Comparisons.

In one city, where more sanitary methods of cleaning the schools have been in use for some years, the figures for the corresponding years, 1898-1909, show some interesting differences. I refer to the city of Worcester, Massachusetts. The commissioner of health of that city has sent me figures for the period indicated. The three charts showing the relative percentages of deaths in the two cities of New York and Worcester would seem to show a better sanitary condition in Worcester. In every instance the proportionate number of cases was smaller, and for each disease the death rate has been appreciably smaller.



Percentage of deaths, Measles, Scarlet Fever, Diphtheria, New York City, 1898-1910. Annual Fluctuations.

The charts show what may be expected if proper sanitary methods are adopted. The average death rate in New York City, for the time covered, from diphtheria, was 13.02 per cent. In Worcester it was but 7.8 per cent. In one school in Worcester, the first year the sanitary method of cleaning was tried, there was not a single infectious disease during the entire year among 425 children. The first two of these comparison charts show plainly the sudden drop in the death rate from diphtheria, both in New York City and in Worcester upon the introduction of the anti-toxin treatment. The last chart which gives the percentage of death in both cities from all three diseases combined, shows that the rate of death for all the diseases combined has risen during the last three years in Worcester, passing that of New York in 1907. This was due to a very severe epidemic in Worcester during the years 1907 and 1908.

What is the explanation of the sudden rise in the number of cases of contagious diseases in the fall? Why should the death rate be greater in our own city than elsewhere? There are three great causes:

First—Unclean methods of drinking from common DRINKING CUPS. Second—Improper methods of VENTILATION. Third—Improper SWEEPING AND DUSTING.

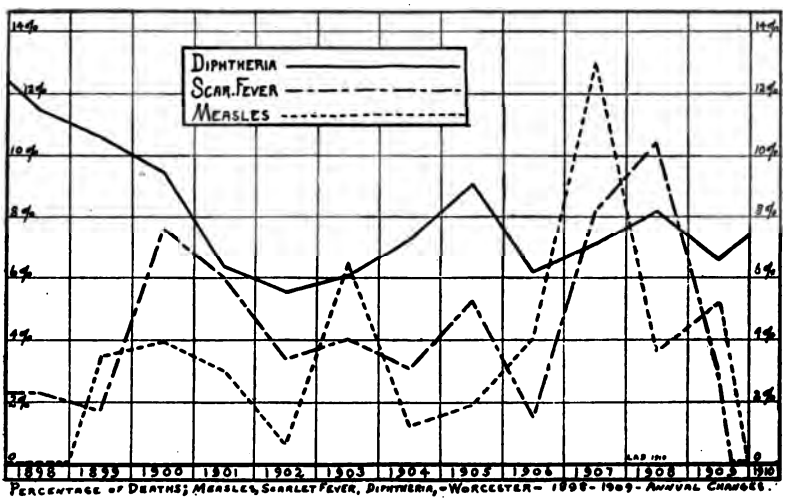
DRINKING CUPS.

There can be no doubt that the use of common drinking cups is dangerous, and that infectious diseases are spread thereby. If they must be used they should, when not in use, be constantly washed by a stream of water, on the principle of the drinking fountains in most of our parks. It would be better to equip all schools with these sanitary fountains. It might be more advisable to furnish to the schools the paper cups which are thrown away after using. The State Board of Health of Wisconsin has just carried into effect a new law which prohibits entirely the use of common drinking cups on railroad trains.

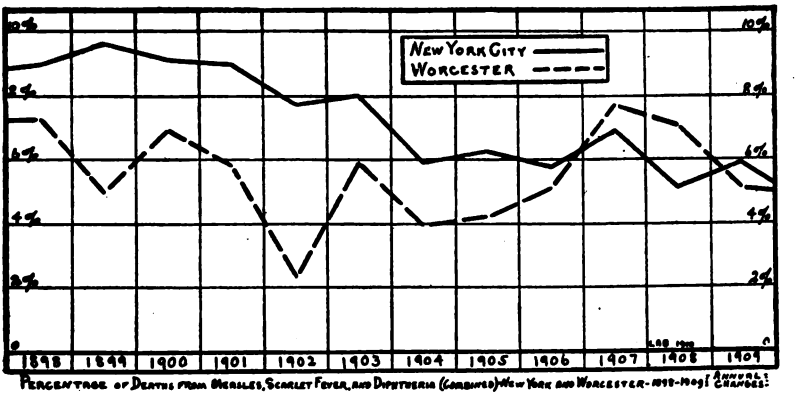
THE VENTILATING APPARATUS.

The ventilating apparatus of every school should receive very careful attention.

1. The air should be taken in from a locality that is free from contaminating influences, thus insuring purity and cleanliness. Often air is taken in from the street level or from yards not over clean, or from a location altogether too near the toilet rooms. The air should be taken through flues opening at the top of the building, or at some considerable height above the street level. In new schools these precautions are generally



PERCENTAGE OF DEATHS; MEASLES, SCARLET FEVER, DIPHTHERIA, - WORCESTER - 1898 - 1909 - ANNUAL CHANGES.



PERCENTAGE OF DEATHS FROM MEASLES, SCARLET FEVER, AND DIPHTHERIA (COMBINED) - NEW YORK AND WORCESTER - 1898-1909 - ANNUAL CHANGES.

taken, but there are many old schools that should be attended to at once in this respect.

2. The air should be sprayed or washed as it passes into the blower, most of the dust particles being thus removed. In connection with this, the following letter from John Lyman Faxon, an architect in Boston, is interesting:

BOSTON, MASS., Sept. 19, 1907.

Mr. Lyman A. Best, President Brooklyn School Teachers' Association, Brooklyn, N. Y.

Dear Sir: I note in press reports what you have had to say about feather dusters and dust, in regard to spread of disease in schoolrooms, and thought you might be interested to know about a preventive.

Some years ago I built a schoolhouse in this city, and designed, as part of the heating and ventilating system, a simple water spray apparatus, which thoroughly washes out all dust and dirt (90 per cent) from the air supply, and it has been in operation ever since.

The school accommodates 774 pupils, and the janitor says that it reduces the care of the building a good third. I was in the building a few days ago, and the air was as fresh and free from odor as the day the school was built.

You would be surprised to see the great amount of black stuff—deposit—washed out. . . . The cost of washing the air is about $52 per year, or about 7 cents per year per pupil.

Yours truly,

JOHN LYMAN FAXON.

3. If the air is heated before it is sent to the classrooms, thereby causing the air to lose a large proportion of its natural moisture, it should again be passed through a spray of water or through steam.

In this connection—and by permission of *McClure's*—the following is quoted from Burton J. Hendrick's article in the August number of that magazine on "Oxygenizing a City," in which he describes how Dr. William A. Evans, health commissioner of Chicago, got fresh air into the street cars, schools and tenements of that city, thereby making Chicago the best ventilated city in the United States.

How Children are Kiln-Dried in the Public Schools.

The old street cars illustrated the quickly acting dangers of bad air—those of bacterial infection. The public schools well illustrated the slow acting—the lowered resistance to disease caused by spending nearly the entire day in close, hot, dry rooms. In the fall, the Chicago schools open their doors to thousands of bright-eyed, rosy-cheeked boys and girls. Then the janitor turns on the steam, the teacher shuts down the windows, and lessons begin. Soon the color disappears from the children's faces, the brightness from their eyes, the activity from their bodies. They grow listless, stupid, irritable; they fall behind in their lessons, and become a problem and a torment to their teachers.

Dr. Evans attributes these changes not so much to original sin as to bad ventilation. His air tests in the Chicago public schools showed that they exemplify all the terrors of hot-air heating. The most modern systems eliminated the use of windows and doors; the opening of the windows, indeed, usually disarranged them. In nearly every school a deadly feud was raging between the janitor and the teachers. The janitor had only one interest. The rule required 72 degrees of heat everywhere, he therefore kept his fires blazing and his steam coils sizzling in a frantic effort to maintain the standard. The gasping teacher and children, however, would occasionally seek relief by opening windows. But the heating system would not work with open windows; and the gentleman in the basement and the teacher were thus perennially on bad terms.

Dr. Evans found valuable allies in the medical inspector of one of the schools in the stockyards district, Dr. A. W. Schram, and in its prin-

cipal, Mr. William E. Watt. On his first appearance in the Graham School, Dr. Schram amazed the teachers by an almost clairvoyant insight into the mental capacity of the pupils.

"This boy is bright," he would say, indicating the child as he passed down the aisle.

"This one cannot learn anything," he would add, pointing out another. "He has learned nothing since cold weather set in."

"This girl is only fairly bright."

"Ah, here we have the brightest child in the room! But this one," passing a pale, heavy, expressionless-eyed Polish girl, "will never learn anything in an ordinary school."

"You are right in every case," the teacher said. "But how did you know it? By the bumps on their heads?"

"Not at all. By their noses, their throats, and their glands."

Dangers of Hot Thirsty Air.

The thing most responsible for their backwardness was hot, dry air. In their daily air pabulum these children were getting very little moisture. All air fit for the sustenance of human beings contains a large percentage of water vapor. This percentage in outside air is fairly uniform—in meteorological terms, the relative humidity of out-of-doors air is 72. Water in the air everywhere tends to seek this level; if any of the vapor is removed, then the air rushes around, attempting to extract it from other sources.

Now, the Chicago schools—and the public schools in nearly all American cities—took this humid air from outdoors, and heated it until nearly all the water was squeezed out. The schoolrooms were thus filled with air the relative humidity of which was only 18, whereas nature's own air contains 72. In accordance with irrevocable natural law, this dry, thirsty air went scurrying around the rooms, frantically attempting to absorb enough moisture to restore its equilibrium. Where could it get it? What better place than human bodies—aren't we 80 per cent pure water?

To quench its thirst in this way is good for the air, but bad for the children. The loss of water is a serious thing for the human body. We can live without food for three weeks; we cannot live without water for three days. A very dry atmosphere is especially bad for the nose, throat and bronchial passages; for these are the handiest objects of attack. These passages lose their moisture when assailed by dry air; they crack as mud cracks after the water is baked out, and thus become sore and catarrhal. The secretions in these passages are powerful germ-killers; and, once dried up, the natural resistance of the body to contagious diseases is largely destroyed. The child subjected to such an atmosphere for any length of time becomes kiln-dried and unfitted to perform the usual functions of his body, to say nothing of his mind.

"A bad nose," Dr. Schram explained to the teachers, "a dry, cracked throat, a lump under the jaw or the arm—you can't do much with such children. When I found one of these bad symptoms, I said the child was slow to learn; when I found two, I said he was dull; and the child with three cannot learn anything."

As a result of this agitation, the Chicago educational system has originated a new verb—"to humidify." The meaning is simple: all hot air, before entering the schoolroom, is passed through jets of water or steam. It now picks up its moisture in "humidifying" chambers in the basement, instead of in the throats and nasal passages of the children and teachers.

Open School Windows in Zero Weather.

Principal Watt has gone even further. In the lower grades of his school he began the experiment, last winter, of abolishing heat altogether. In these rooms he has adopted a new educational motto: "Less instruction and more oxygen." In keeping with this, these little children no longer sit together at desks, with folded hands. The desks have been removed, kindergarten chairs have been brought in, and the pupils given the utmost freedom of movement. In cold winter weather they wear their wraps and hats—and these are their only source of heat. In zero weather, they sit at their table in front of open, "drafty" windows. Their fingers do not get so numb that they cannot write on the blackboards, and physical discomfort is unknown.

One day last winter when the thermometer registered ten below zero, a woman school visitor came into one of these cold rooms. She was horrified at what she described as "cruelty." But the children simply grinned. They enjoy the change immensely, and have nicknamed the old hot-air place the "hospital rooms" because there are so many sick children in them. The parents likewise are enthusiastic. "I think it is best for Mary to go into the cold room; I think it will make her bright and make her learn fast," writes one mother. "As Walter is not altogether healthy," writes another, "I would sooner you would put him in a fresh-air room; his color is not good."

There are reasons in plenty for this attitude. Colds, glandular troubles, the normal afflictions of school life, have virtually disappeared, and the mentality of the children has responded to the change. By Christmas practically all of the children in the cold-air rooms had finished their year's work! They were learning to read and write almost unconsciously. And the teachers who had previously been irritable, listless, despondent, sick of life, and sick of teaching, had regained their early zeal.

On the roof of one of the Hull House buildings the United Charities of Chicago has established an open-air school for tuberculous children. Here, on the most freezing winter days, are fifteen invalids from the stockyards district, clad in close-fitting Eskimo suits—the girls, like the boys, in trousers—with moccasins and blankets, bravely fighting for health and life. They are gaining in weight and color, and, like the children in Mr. Watt's open-air school, are making abnormal progress in their lessons. Like Mr. Watt's children, they also like the outdoor method. Last winter, when the time arrived for the Christmas vacation, they all, to a child, appeared at the school, and persuaded the teachers to hold the sessions as usual.

4. The fan and blower box, and all parts connected with the ventilation of the school, should be kept scrupulously clean at all times. At least once a week the blower blades and other parts should be wiped clean. The air tubes passing through the building should be blown out weekly, and a spray of carbolic acid should be blown through the tubes at regular intervals when the school is not in session, say every Saturday. This will insure the destruction of any germs that might find a lodging place in the ventilating flues.

5. The outlet for foul air should be placed in such position in every classroom that the contaminated current will not pass near pupils or teacher. In many rooms the outlet is immediately behind the teacher's chair, and the teacher who occupies this place will

breathe all day the air that has been exhaled by her pupils. If a teacher's chair is near the outlet she should move the chair away. She should not allow any pupils to sit near the outlet. She should never allow the outlet to be closed.

Sweeping and Dusting.

The most important cause of the spread of infectious diseases is dust, combined with improper methods of sweeping.

Any one who has watched the cleaner (?) moving in a cloud of dust as he passes through the halls or schoolrooms after school, shoving a brush before him, and who will note the layer of dust which settles over floors, furniture, and side walls after he has finished sweeping, will not wonder any further how the germs get mixed and distributed. The certainty of the cause will be confirmed upon watching the average janitor's assistant as he or she knocks this layer of dust from the tops of the schoolroom desks by means of a feather duster, the dust remaining in the room and settling, most of it, on the floor, some of it back on the desks. This is the final work of the afternoon. In the morning the feather duster is again called into requisition, and the dust is again knocked from the tops of the desks, and as school convenes shortly after, before the floating dust has a chance to settle, the room appears clean. The dust which settled to the floor the night before begins to rise and fill the air as the pupils arrive and stir it by their movements.

It is not claimed, of course, that schoolroom dust is responsible for everything bad, but there can be little doubt that it is a factor, and an important one, in the dissemination of disease among children. A simple and reliable test should be made by the board of health which would determine, in any case, just what effect the schoolroom dust must have in this respect. Let samples of the dust be taken from the walls and floor, and from the air while the room is being swept. Cultures of the germs found mingled with the dust would show conclusively whether diphtheria, or other infectious germs, were present. There can be little doubt that most of the diseases are transmitted to the children during the months when school is in session, and the conclusion, already drawn by many who have investigated the question, that the schoolroom is responsible cannot be successfully denied.

Under the conditions which prevail in most schools I have no doubt that the occupation of a school teacher must be classed as extra-hazardous, as very often her health, and even her life, is endangered by the criminal carelessness displayed in the cleaning of the school. I add in all seriousness that the occupation of a pupil living in a room contaminated by filthy bacteria-laden dust is extra-hazardous.

Many years ago Germany established liberal pension laws for the teachers of that country, the argument advanced by the German government in explanation of the pension law being that "teachers, of all state officers, are the ones who deserve the highest consideration, as they are the ones who are most likely to sacrifice their health in the discharge of their duties." The late Dr. Harper, president of Chicago University, once said: "The number of physical wrecks furnished by the profession of teaching is certainly larger, in proportion, than that of any other calling in life. In no other work can it be so truly said that the toiler gives forth his own strength to the ones for whom he toils." I have a case in mind: A principal, with wife and four children, and two sisters living at his home, carried home from school diphtheria and scarlet fever germs. To-day the only members of his family now alive are himself and one son. His wife, three children, and his two sisters, have been sacrificed to his calling!

What Can Be Done?

Criticism of methods is bad unless better methods are suggested. In other words, constructive criticism should be expected of any one who is trying to reform present conditions. The following is, therefore, offered toward the amelioration of present conditions:

1. Destroy all feather dusters in the school, and prohibit their further use. No more devilish death-dealing device was ever invented than the feather duster, a stirrer up of filth and a harbor for filth. A janitor who complained to the authorities that I had refused to order feather dusters for him (actually used by him to sweep the floors), said that he had kept house for forty years, and that he had never allowed the use of a feather duster in his house during that time, yet he would order them to be used to stir up the dust which our children would breathe!

2. No part of the school—basement, stairways, halls, offices, or schoolroom—should be dry swept. A copious application of wet sawdust should be made before sweeping. The sawdust should be wet enough so that when a handful is squeezed water will be squeezed out. No dust will rise from the floor upon sweeping if this is done. Every part of the floor should be sprinkled with sawdust. The application of a small amount to one spot and the sweeping of this over the whole floor, expecting it to pick up all the dust is ridiculous. Janitors complain that the application of wet sawdust will stain the floor! What is a stain on the floor compared with clean sweeping? The janitor should keep a barrel of wet sawdust ready for use. A small amount of carbolic acid added to the water will keep the sawdust sweet and the carbolic acid will act as a disinfectant, killing the germs in the sweepings. If this method of sweeping is used the necessity for

the use of any duster will be reduced to a minimum. There are preparations much better than sawdust, but as they are not listed for our use we must pay for them ourselves if we use them. One preparation used in my own school showed remarkable power to gather up immense quantities of dust with the application of a very small amount of material. The Michigan State Board of Health recommends the following:

(a) To a pailful of wet sawdust add half a pint of kerosene and a tablespoonful of sulpho-naphthol or formaldehyde.

(b) Heat one third part sand, and add two thirds part sawdust. To a pailful of the mixture add one half pint of paraffin oil (kerosene may be used) and mix thoroughly. This preparation produces excellent results.

(c) Boil one pound of salsoda and one pound of chloride of lime in a gallon of water. Dampen sawdust to be used for sweeping with this solution. This preparation is excellent for restoring the natural color of floors.

3. Dust will get into the classrooms, no matter how carefully the sweeping is done. The boys bring in dirt on their shoes, much dust is blown into the room through the ventilators and windows. There will be necessity, therefore, to remove dust from the desks and projecting parts of the room. This dust should be removed by the use of a dampened cloth, and not by the use of a feather duster. This can be done by the pupils mornings as part of their work in domestic science. Two or three girls might come early who could easily remove the dust and care for the dust cloths. Certainly parents should not object, as often the very lives of the pupils are at stake. This will answer the objection raised by janitors that it takes longer to wipe the desks with a cloth than it does to knock the dust off with a duster, and, if the pupils help, the janitor will have more time to give the rooms a very careful sweeping in the manner outlined in suggestion 2.

4. The side walls should be carefully and frequently brushed down. Needless to say, the walls should be painted, in order that cleanliness may be assured. All blackboard troughs should be emptied and thoroughly cleaned every day.

In addition to the above suggestions, which can be carried out at once by every janitor, the following suggestions are earnestly offered to the proper school authorities:

1. Every schoolhouse to be erected in the future should be provided with a vacuum cleaning apparatus. The engine which now runs the ventilating plant could, after school, run the vacuum plant.

2. Every existing schoolhouse which has power should be equipped with a vacuum cleaning plant.

3. All schoolhouses without power, especially if near a current of electricity, should be supplied with one of the numerous vacuum pumps.

Objections Made by Janitors to Vacuum Process.

My experience has been that janitors do not differ greatly from other people when it comes to adopting innovations of any kind. They immediately raise objections to the vacuum process. The principal objection is that it requires TIME to go over the room carefully with the nozzle of the apparatus. Another objection is that all paper and other bulky objects on the floor must be picked up by hand before the apparatus can be applied. In other words, the present "method" is easier and quicker. Of course, janitors' assistants think more of getting the work done quickly than they do of getting it done well. If the present method were changed to a careful sweeping, after a thorough sprinkling with wet sawdust, and a careful wiping of the furniture with dampened cloths, the time required would be about the same as that required to use properly the vacuum process. The present "lick-and-a-promise" method is so highly unclean and dangerous to the health of janitors as well as to the health of teachers and pupils that, if change cannot be brought about through appeal to reason and common sense, appeal should be made to the health authorities to interfere.

I would suggest that the pupils could help, in the vacuum process as in the other. They are responsible for the scattering of papers and débris on the floors of their classroom, and the teacher might, therefore, have the pupils scavenger the room just at dismissal, and leave it in condition for the janitor to go at the cleaning immediately with the vacuum nozzle. It might even be perfectly feasible to allow the larger boys to use the vacuum apparatus.

Objections by Authorities on Plea of Economy.

Objections are raised by the school and other authorities that the methods suggested above for properly cleaning schools or other public buildings are more expensive than the present methods. Are they? A conservative estimate places the cost of preventable germ diseases in this country at $1,500,000,000 a year! How much did the citizens of this city have to pay in doctors' bills for the 301,598 cases of measles, the 160,332 cases of scarlet fever, and the 185,278 cases of diphtheria, to which I have called attention? What were the funeral expenses of the 9565 who died from measles, the 10,063 who died from scarlet fever, the 24,129 who died from diphtheria? Just think! In twelve and a half years, counting only three of the numerous

diseases, there were 657,208 cases, and 43,757 deaths, all preventable! Wouldn't it be better to spend less money on proper sanitation, and have our loved ones with us, than to spend many times the cost of this sanitation in doctors' and funeral bills, and our loved ones gone?

Is it not worth while, no matter what the cost, to unite in the effort to adopt the preventive methods which have been outlined, and thus assist in reducing to a minimum the slaughter of the innocents?

REPORT OF THE COMMITTEE ON THE STANDARDIZATION OF SCHOOL BOOKS, ETC.

On account of the fact that your committee was somewhat scattered geographically and also busily occupied with professional duties, only a preliminary report can be made. It seems best also to confine this report to the special question of hygienic norms for text books. The report consists of two parts: first, a résumé of certain standard norms for paper and printing based on the results of investigations hitherto made; second, a few suggestions in regard to further investigation and possible improvements.

I.

There is at the present time a fairly good consensus in regard to the norms for the printing of text books for children. In general the type should be clear. It should be sufficiently wide and there should be no hair line serifs, and especially the upper part of the letters should be free from fantastic features of any kind. The following represent what may be considered reasonable minima:

(a) The paper should be unglazed, free from shine and opaque.

(b) The eye moves by a succession of movements and stops, and a long backward sweep to beginning of the next line.

Fatigue is markedly increased by the difficulty of the backward movement and of locating the beginning of the next line if the line is too long. The maximum of safety is 90 mm., and 60 mm. to 80 mm. is better.

(c) The margin should be sufficient so that the eye, in the backward movement, does not *swing off* the paper, and the inner margin should be wide enough so that the inner end of the line is not obscured by the curvature of the paper.

(d) The size of the type should be as follows:

1. Adult's standard.
   (i) The height of the small letters should be 1.5 mm.
   (ii) The width of the vertical stroke should be .25 mm.
   (iii) The space within the letters should be .5 mm.
   (iv) The space between the letters should be .50 to .75 mm.
   (v) The space between the words should be 2 mm.
   (vi) The leading should be 2.5 mm.
2. The standards for children are as follows:

A. First Grade.
   (i) The height of the small letters should be at least 2.6 mm., with the other dimensions in proportion.
   (ii) The width of the vertical stroke should be from .4 mm. to .5 mm.
   (iii) The space within the letters should be from .8 mm. to .9 mm.
   (iv) The space between the letters should be about 1 mm.
   (v) The space between the words should be about 3 mm.
   (vi) The leading should be from 4 mm. to 4.5 mm.

B. For the second and third years the standard may be reduced slightly, but the letters should not be less than 2 mm. in height and the leading should be 4 mm.

C. For the fourth year height and leading should not be less than 1.6 mm. and 3 mm. respectively. It would be better to retain the standard of the fourth year through the sixth year.

It may be added that blackboard writing should be large and distinct. In order to be easily read in the rear of a thirty-foot room the small letters should be at least two inches high and larger for the lower grades.

Writing books should be free from network of lines. The ink should be jet black, and slates are not desirable.

Maps should be free from unnecessary detail, the lines should be clear and salient, and the lettering should be large and plain.

References: Shaw, School Hygiene, ch. IX; Hope and Brown, School Hygiene; Huey, Psychology and Pedagogy of Reading; Schwender, Die wichtigsten Ergebnisse der experimentellen Untersuchungen über das Lesen.

Instructional procedure:

1. The instruction should be divided so that the eyes are not used for near work too long continuously.

A. Diminution of power of focusing for small objects increases rapidly the longer the eyes are used.

B. In the first year, the time should not be longer than fifteen minutes, increasing to one hour in later adolescent years.

2. There should be a frequent change of tension by looking at distant objects.

3. There should be frequent recesses in the lower grades, to relieve the general nervous tension.

4. Proper position should be insisted upon in reading, writing, drawing, etc.

A. The head should be erect, and if bending forward is necessary, it should be from the trunk.

B. In reading the book should be held at a distance of at least twelve inches as nearly as possible.

5. The handwriting should be large. The small letters should not be less than 5 mm. high for beginners, and 2.5 mm. in adolescent years.

6. There should be a preponderance of oral and blackboard instruction in the early years.

7. The home work should be very limited.

II.

The weight of the school books that are carried by pupils has for some time been recognized in Germany as a serious matter. Your committee would suggest that it is desirable that text books, except the very small ones, should be printed on a good quality of the modern light papers.

At the present time there is no satisfactory consensus in regard to the question whether the paper of school books should be smooth or somewhat rough. It seems possible that a certain degree of roughness will reduce the glare which, to some extent, is inevitable with clear white paper. This question should be tested experimentally.

It seems desirable that the question whether the paper of school books should be white or slightly tinted should be studied. Many authorities think that a paper tinted very slightly with yellow or blue would be better than a paper entirely white. Experimental evidence seems to indicate that black on white is more legible than on tinted paper, while clinical experience seems to point to the advantage of a slight tint. This question of tint should be experimentally investigated.

An investigation in regard to the legibility of some forty different kinds of type is now being made in the psychological laboratory at Clark University. It is expected that experimental tests can be made also of the problems of smooth paper or rough, white paper or tinted, and some other points.

Your committee does not ignore the importance of demanding the optimum conditions of light, color of walls, character of curtains, and the like, in the schoolroom, but have not concerned themselves especially with these topics as that matter has already been studied, and they would refer those interested to the report of the Boston Committee. See Myles Standish, "Artificial

Illumination of Schoolrooms," *School Hygiene,* Vol. I., No. 6, p. 74, January, 1909.

Investigations in regard to the hygiene of the eye are being made at the present time by a Committee of the National Education Association on the Prevention of Blindness, with which your committee hopes to coöperate, the chairman of your committee being a member of said committee of the N. E. A.

BIBLIOGRAPHY.

1. Cohn, Hermann. Hygiene of the Eye in Schools. London, 1886. 236 p.
2. Hope and Brown. Manual of School Hygiene. Cambridge, 1901. 207 p.
3. Huey, E. B. Psychology and Pedagogy of Reading. N. Y., 1908. 469 p.
4. Javal, E. Physiologie de la lecture et de l'ecriture. Paris, 1906. 296 p.
5. Shaw, E. R. School Hygiene. New York, 1901. Chapter IX. 255 p.
6. Schwender, J. Die wichtigsten Ergebnisse der experimentellen Untersuchungen über das Lesen. Leipzig, 1910. 56 p.
7. Zeitschrift für Schulgesundheitspflege. Monthly journal. Published by Leopold Voss. Hamburg. See articles by Cohn, Sack and others.
Further literature is referred to by Huey and others.

WILLIAM H. BURNHAM, PH. D.,
WILLARD S. SMALL, PH. D.,
MYLES STANDISH, M. D.,
Committee.

STATUS OF MEDICAL INSPECTION IN THE UNITED STATES.

JOHN J. CRONIN, M. D., BOROUGH CHIEF, DIVISION OF CHILD HYGIENE, BOARD OF HEALTH, NEW YORK CITY.

Through the courtesy of our president, the chairman of this committee is able to report on what is being done in a number of places in the United States to conserve the health and improve the efficiency of school children.

After some deliberation it was decided that the knowledge wanted by the Association was what was being done in the way of medical inspection of school children, and in how many places was some attempt made to do the work. There have been returned 758 reports from many places.

The questionnaire of last year was deemed entirely too exhaustive, and therefore required too much labor on the part of those who were requested to fill out the required data. This fact probably accounted for the small number of reports received.

Again, the questionnaire was directed to the health officer in places about which we did not have the knowledge whether school inspection was adopted or what municipal authority controlled the work. This year the questionnaire was directed to the superintendent of schools. The procedure materially increased the number of returns. Outside of New York it is a most striking fact that the educational authorities dealing directly with the children are more solicitous about their physical well being than are health authorities.

The increased efficiency of children in their school work, when in good health, is an immediate effect of medical supervision, whereas the remote effect of this work as indicated by lessened case incidence of contagious diseases is not so evident as to incite health authorities to strenuous activity. The question of immediate control, however, is not a very vital one, as long as the work is thoroughly performed and results achieved.

It must be understood that medical inspection is only worthy of the name when it is performed by medical men who are peculiarly fitted for the work, interested in the results obtained and who take pride in the manifest good results. Every physician engaged in this work should realize that he is a research worker, and only by intense personal interest and study will medical inspection attain any degree of perfection.

In calculating the results of medical inspection, I fear that a false criterion has been subconsciously accepted. Children are animate beings, affected by heredity, environment and many other diverse influences, and can never be reduced to statistical tables and studied in groups. Many otherwise remarkable publications fail in this point as often it seems proven that an abnormal child is equal in school efficiency to the normal. Such a contradiction cannot obtain.

The only criterion by which the value of medical inspection can be gauged is, to compare the school efficiency, moral and social tone, psychic responsiveness and increased potentialty of the child before and after it has received the benefit of medical advice and treatment.

Some 1400 communications were sent out, with returns from 758. The data requested was:

1. Do you conduct medical supervision of school children?
2. Is there inspection for contagious diseases?
3. Are vision and hearing tests made by teachers?
4. Are vision and hearing tests made by physicians?
5. Are complete physical examinations made by physicians?
6. Is the system under the health or school authorities?
7. State the number of school physicians.
8. Does the system employ nurses?
9. State the number of school nurses.
10. Does the system include dental inspection?
11. Is dental inspection performed by dentists?

The returns are tabulated under the following geographical areas:

North Atlantic States.
South Atlantic States.
South Central States.
North Central States.
Western States.

Returns were received from 308 North Atlantic States; 45 South Atlantic States; 67 South Central States; 286 North Central States and 52 Western States.

The tabulated report gives the results, and therefore I need not take up your time in reading it.

The report further shows the year medical inspection was started, and the salaries of the nurses and doctors.

In concluding this statistical report, I am constrained to inquire why is it that only 337 places of 758 reporting have made any attempt to protect the health of their school children? And one might as well make the report complete by including the number written to but who did not reply, and therefore ask why is it that only 337 places of 1400 places, first, second and third-class, have adopted medical inspection?

Is this Association doing what it should to spread the gospel of medical inspection?

What can we do to reach some influential person in the 1063 places where there is no medical inspection of schools?

What should be done to standardize and unify the method of inspection in the places now claiming the operation of a system?

Should we accredit as medical inspection any system where medical work is performed by teachers or nurses?

How can this Association promulgate propaganda to stimulate interest?

Knowing as well as I do the practical difficulties of inaugurating any system requiring appropriation for its conduct, I still feel that the Association should maintain that the testing of one or two faculties, as vision and hearing, is not medical inspection, as the success of the work depends upon the healthy physical condition of the child as a whole, and not its component parts. We shall only get part of what we ask, therefore we should ask much in the hope that enough is given to be useful.

The whole question seems such a simple, self-evident, economic and humanitarian proposition that the necessity of pleading for its general adoption will not make praiseworthy reading in history.

We may well take example from work performed by the Playground Association of America, which has made such wonderful progress in the past few years.

Subscribed is the full report on returns received.

	Cities Reporting	Having Medical Inspection	Year Work Was Begun	Inspection for Contagious Diseases	Vision and Hearing Tests by Teachers	Vision and Hearing Tests by Doctors	Physical Examination by Doctors	System Under Board of Health	System Under Bd of Education	Number of School Doctors	Cities Having School Nurses	Number of School Nurses	Annual Salaries	Having Dental Inspection	Inspection by Dentists
North Atlantic States.															
1. Maine	10	4	...	3	10	1	3	1	3	4	...	...	...	2	1
2. New Hampshire	6	2	...	2	3	2	2	1	1	11	...	...	...	2	1
3. Vermont	5	...	...	...	5	...	...	...	...	...	...	...	...	...	...
4. Massachusetts	86	84	...	31	84	18	48	17	67	299	11	44	...	27	6
5. Rhode Island	12	8	...	7	5	7	3	3	5	10	1	1	...	2	1
6. Connecticut	21	12	...	13	17	5	4	10	2	24	5	5	...	3	1
7. New York	60	14	...	15	40	13	10	10	4	171	9	155	...	8	3
8. New Jersey	34	34	...	34	10	32	31	...	34	91	10	24	...	21	2
9. Pennsylvania	74	24	...	18	25	17	10	7	17	109	3	18	...	11	3
Total	308	182	...	173	199	95	111	49	133	729	39	242	...	76	18
South Atlantic States.															
1. Delaware	1	1	...	1	1	1	...	1	...	18	...	...	...	1	1
2. Maryland	5	1	...	1	...	1	1	1	...	5	1	5	...	1	...
3. Dist of Columbia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4. Virginia	9	4	...	4	7	2	1	1	3	12	1	1	...	3	1
5. West Virginia	6	2	...	2	1	...	1	...	2	1	1	1	...	1	...
6 North Carolina	6	2	...	1	4	1	...	...	2	3	...	...	...	1	1
7. South Carolina	8	2	...	2	...	2	2	1	1	4	...	...	...	2	...
8. Georgia	8	3	...	3	1	2	1	1	2	2	1	3	...	1	...
9 Florida	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Total	45	15	...	14	15	9	6	5	10	45	4	10	...	10	3
South Central States.															
1. Kentucky	13	6	...	5	4	3	1	2	4	9	2	2	...	1	1
2. Tennessee	5	3	...	2	3	2	1	1	2	2	...	...	...	2	1
3. Alabama	7	2	...	2	2	2	2	...	2	2	...	...	...	1	...
4. Mississippi	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5. Louisiana	3	1	...	1	1	...	...	1	...	1	...	...	...	...	...
6. Texas	24	8	...	8	11	4	2	2	6	8	...	...	...	1	...
7. Arkansas	5	1	...	1	1	...	...	1	...	1	...	...	...	...	...
8. Oklahoma	8	4	...	4	3	3	3	1	3	8	...	...	...	1	...
Total	67	25	...	23	25	14	9	8	17	31	2	2	...	6	2
North Central States.															
1. Ohio	56	9	...	6	23	8	3	2	7	49	3	19	...	7	5
2. Indiana	41	9	...	7	25	4	1	3	6	30	...	...	...	5	3
3. Illinois	42	15	...	12	18	8	4	5	10	114	3	42	...	11	3
4. Michigan	37	16	...	13	20	9	4	3	13	64	6	14	...	3	3
5. Wisconsin	31	13	...	9	19	9	6	2	11	36	3	6	...	8	3
6. Minnesota	13	6	...	5	5	5	3	...	6	14	2	5	...	4	1
7. Iowa	19	4	...	5	9	2	1	...	4	2	2	4	...	1	...
8. Missouri	16	6	...	5	3	5	3	1	5	30	1	5	...	3	...
9. North Dakota	5	1	...	1	3	1	...	...	1	...	...	...	...	...	...
10. South Dakota	4	1	...	1	3	1	...	...	1	...	...	...	...	2	2
11. Nebraska	7	2	...	2	2	2	1	...	2	2	1	1	...	1	...
12. Kansas	15	2	...	1	4	...	...	...	2	1	...	...	...	1	1
Total	286	84	...	67	184	54	26	16	68	342	21	96	...	46	21
Western States.															
1. Montana	5	...	...	...	2	...	...	...	...	...	...	...	...	1	1
2. Wyoming	2	1	...	...	1	1	...	1	...	...	...	...	...	...	...
3. Colorado	7	6	...	3	7	2	2	...	6	...	1	1	...	3	...
4. New Mexico	3	2	...	2	1	1	...	1	1	3	...	...	...	...	...
5. Arizona	3	2	...	2	2	...	...	1	1	1	...	...	...	...	...
6. Utah	2	2	...	2	2	1	1	...	2	2	...	...	...	1	...
7. Nevada	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8. Idaho	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9. Washington	9	6	...	5	3	4	3	1	5	22	4	7	...	4	1
10. Oregon	5	2	...	2	2	1	1	2	...	5	1	1	...	1	1
11. California	14	10	...	8	6	8	8	2	8	14	4	12	...	6	1
Total	52	31	...	24	26	18	15	8	23	47	10	21	...	16	4
Final Grand Totals.															
North Atlantic	308	182	...	173	199	95	111	49	133	729	39	242	...	76	18
South Atlantic	45	15	...	14	15	9	6	5	10	45	4	10	...	10	3
South Central	67	25	...	23	25	14	9	8	17	31	2	2	...	6	2
North Central	286	84	...	67	184	54	26	16	68	342	21	96	...	46	21
Western	52	31	...	24	26	17	15	8	23	47	10	21	...	16	4
United States	758	337	...	301	449	189	167	86	251	1194	76	371	...	154	48

YEAR STARTED.

	1890	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910
North Atlantic	..	2	..	..	1	2	..	1	5	3	3	3	8	17	19	28	33	42
South Atlantic	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	2	3	7
South Central	1	..	..	..	..	..	..	..	1	1	..	..	1	1	2	3	6	8
North Central	..	..	..	..	..	..	..	..	..	2	..	2	4	1	1	9	20	34
Western	..	..	..	..	..	1	..	..	..	..	..	..	..	..		3	14	10
United States	1	2	..	..	1	3	..	1	6	6	3	5	16	19	27	45	76	101

SALARIES OF DOCTORS.

	Gratis	$1 to $100	$101 to $200	$201 to $300	$301 to $400	$401 to $500	$501 to $600	$601 to $700	$701 to $800	$801 to $900	$901 to $1000	$1001 to $1100	$1101 to $1200	$1201 to $1300	$1301 to $1400	$1401 to $1500	$1501 to $1600	$1601 to $1700	$1701 to $1800	$1801 to $1900	$1901 to $2000	$2400	$3000	$3800	Fees
North Atlantic	13	33	29	22	17	14	8	1	4	1	4	...	2	...	1	1	...	...	1	...	...	...	...	...	11
South Atlantic	4	...	2	1	1	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...
South Central	4	...	...	4	...	1	1	...	3	...	1	...	2	...	...	1	...	...	...	...	...	...	...	...	1
North Central	8	6	3	4	3	2	2	...	1	2	3	...	1	1	...	1	...	...	...	...	...	...	...	1	2
Western	1	3	...	1	...	2	2	...	1	...	3	...	1	...	...	3	...	...	...	...	...	1	1	...	2
United States	30	42	31	32	21	19	14	1	9	4	11	...	6	1	1	6	...	...	1	...	1	1	1	1	16

SALARIES OF NURSES.

	Gratis	$1 to $100	$101 to $200	$201 to $300	$301 to $400	$401 to $500	$501 to $600	$601 to $700	$701 to $800	$801 to $900	$901 to $1000	$1001 to $1100	$1101 to $1200	$1201 to $1300	$1401 to $1500	Fees
North Atlantic	1	...	...	...	...	...	8	8	12	6	...	...	...	...	...	1
South Atlantic	...	...	...	...	...	...	2	1	1	...	...	...	...	...	...	...
South Central	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
North Central	1	3	...	2	...	...	4	4	5	1	...	...	...	...	...	...
Western	...	1	...	...	...	...	...	...	1	4	...	1	...	...	1	...
United States	2	4	...	2	...	...	15	13	19	11	...	1	...	...	1	1

INDIVIDUAL INSTRUCTION IN PERSONAL HYGIENE.

THOMAS A. STOREY, M. D., PH. D., PROFESSOR OF PHYSICAL INSTRUCTION AND HYGIENE, COLLEGE OF THE CITY OF NEW YORK.

School instruction in personal hygiene has been, and is being given largely in one of three different ways, or in some combination of these three ways. We offer instruction through the medium of text books and recitations; or we present the desired information by way of talks or lectures; or, finally, we may utilize the laboratory method employing appropriate experiments, perhaps with selected references to scientific literature. Each of these methods has its peculiar fitness for certain educational situations, and all are more or less applicable throughout our instructional system. The laboratory method is characteristic of the university and professional school. The lecture fits into the collegiate scheme. And the text book and recitation are more common in the grades. But all three methods are utilized with varying degrees of purity and more or less irregularly throughout the entire system in its application to the child, the youth, and the adult.

It is not my purpose to offer a destructive criticism of these methods of instruction. On the contrary, I am convinced that we cannot get along without them in certain phases of our educational work. But I am even more certain that these methods all fail more or less completely to secure the educational effect which we must consider the most seriously important and vital. Under the influence of this sort of instruction the pupil and the student almost uniformly classifies the hygienic knowledge he secures with the other information that reaches him through much the same avenues. Personal hygiene easily becomes a lesson to be learned for the single purpose of meeting a requirement, obtaining a mark or passing a grade. Even the student in the university and professional school applies his energy in this subject as in his other subjects largely for the purpose of equipping himself intellectually for his professional activities. In other words, it is not the habit of the pupil or student anywhere along the line to regard the instruction he receives in personal hygiene as being to any great extent applicable to his individual immediate physiological life.

Personal hygiene is a part of the science of physiology. As such it is deserving of the most careful study and research investigation by our greatest scientific minds. No student, young or old, will make a mistake if he studies this phase of physiology for its own scientific, intellectual and humanitarian value. But

from the standpoint of the physiological welfare of the individual concerned, I maintain that the mother who succeeds in teaching her child good habits of eating, good habits of excretion, good habits of bathing, good habits of exercise, and good habits of rest is doing more for the health interest of that child than you and I and all those who work with us are doing with our conventional methods throughout the entire school life of that child. Habit is the thing that counts in personal hygiene. We must have the knowledge, but the knowledge is of little use if it is not applied in the daily habits of the individual.

This attitude towards methods of instruction has influenced me in the organization of the curriculum for the department under my supervision in the College of the City of New York. It has led me to incorporate a certain amount of didactic elementary instruction in the principles of hygiene; it has influenced me to an attempt to place the practical work in the various phases of physical exercise on a crude laboratory basis; and it has caused me to develop a plan of individual instruction in personal hygiene which I believe may be evaluated in terms of hygienic habit. This paper is being presented for the purpose of outlining concisely this plan for "Individual Instruction in Personal Hygiene."

This instruction is applied through hygienic examinations, inspections and conferences administered at least once each half year to every pupil in the preparatory department and to every student in the first and second year classes in the collegiate department. The examinations are made in order to discover the presence of organic, hygienic or functional conditions which may be working against the health interest of the individual or his associates. Each examination is made by a member of the departmental staff, trained and equipped to do the work asked of him. The examinations are much like those made by any careful physician. We secure a record of the important hygienic and other health factors bearing on the family life, such as parental birthplace and occupation, and family disease and mortality. We learn what the boy can tell us about his own previous sicknesses. We record previous injuries, strains or operations. We ask for a history of headache, eye weakness, eye disease, ear troubles, colds of the nose, throat and lungs, obstructed nasal breathing, cough, expectoration, bloody sputum, afternoon temperature, night sweating, loss of weight or strength, vaccination, amount and variety of exercise, open air life, amount and character of sleep, window supply and ventilation of bedroom, appetite, time spent at meals, habit of chewing, condition of teeth, dental service, habits of defecation, habits of bathing, care of underclothing, and use of tobacco. This information is secured through blanks which the boy fills out.

In addition, we examine the condition of his clothing, skin,

hair, nails, vision, eyes, nose, teeth, mouth, tongue, throat, heart, lungs and such other special conditions as appear necessary. After his examination each boy is given such advice as seems necessary and appropriate for the improvement of his habits of eating, excretion, exercise, rest and cleanliness. If there is a physical condition found that appears to need treatment, the fact is entered on a card and sent to the boy's parent or guardian with the request that the card be referred to the regular family adviser, parental, medical or dental as the case may be.

So far the plan I have outlined to you is not very different from many other plans now in operation in various places. But there is one feature in this plan of instruction which is distinctive and which makes it effective. We follow up every piece of advisory instruction we give, and every piece of such instruction must bring us a result. The boy must follow our directions to this extent: He must report to us within a reasonable time and bring with him legitimate evidence that he has followed our advice, or a note from his parent or guardian showing why he has not followed this advice. If this is not done the boy is debarred from all his classes until he does as directed.

And so while we are at the same time giving short lectures to large classes and requiring them to pass written examinations on those lectures, and while it is more than probable that those lectures are looked on more or less as necessary impediments in the progress of the boy from class to class, still in our individual instruction of those same pupils and students, we, through the parent, the family doctor and the family dentist, are securing personal applications of the lessons taught in the lectures. We are securing health habits in the same individuals to whom we are teaching health principles; and the boy is under this instruction, term after term, for five years.

We have been gradually developing this plan of individual instruction during the last four years. In the academic year ending June 1, 1910, approximately three thousand boys of high school and college age were required to take this instruction. We saw these boys over nine thousand times (9406). We gave special advice to 2679 individuals. We found 5602 points upon which it seemed to us wise to offer instruction, and it took 7863 conferences to follow this advice to a finish under our rule. During that year forty-seven boys whom we advised in this manner dropped out of school. How many of these forty-seven boys left primarily because they failed to observe the rule operating under this requirement I cannot say. It may be said, then, that we gave individual instruction to nearly three thousand boys; that we examined these boys on the average three times apiece; that we found on the average two reasons for offering advice to each individual; and that we saw them on the average three times

apiece in addition in order to follow up this advice. We found it necessary to see these boys altogether about eighteen thousand times in order to accomplish the results we were after.

The accomplishment of a piece of work of this sort required more or less time from nine members of my staff and cost us in total something over two thousand five hundred hours during the year. We were busy for approximately thirty-two weeks. The work was about the equivalent of that of two men working eight hours a day, five days in the week, for thirty-two weeks.

My department is not old enough, and its plan of instruction has not been long enough in operation to allow me to reach a final conclusion as to the extent of its effectiveness. This phase of our work indeed is the newest development of our plans. But we already know beyond any doubt that the occasion for giving advice along various lines is rapidly decreasing. We know that the habits of personal hygiene among our boys are becoming more and more satisfactory. The gymnasium uniforms and towels furnished by the preparatory and collegiate boys are characteristically clean. The water in our swimming pool, which is used by between five and seven hundred boys a day, has in it no chemical or bacteriological evidence of human contamination aside from a slight increase in chlorides easily due to perspiration. The care and the condition of the teeth is better (a thousand boys secured dental service last year). There are fewer cases of uncorrected defects of refraction. We have practically no communicable diseases of the skin, eyelids, or other organs of the body that are not under proper and effective home and departmental supervision.

We have the written and objective evidence that the parents of several thousand boys are taking an active, sympathetic, and dollar and cent interest in the health habits, the personal hygiene of their boys.

During the year that ended June 1, 1910, we received communications from 406 physicians, 323 dentists, 26 opticians, and 24 hospital clinics, stating that advice had been given in response to notes which we sent to the parents of our boys.

It is evident, then, that in this plan for the individual instruction of the student in matters of personal hygiene we are cooperating with the parent or guardian in establishing health habits in their boys. It is a safe expectancy that through such a mutual relationship, operating on the average for a period of five years in the case of each boy, we will, in the majority of cases, secure settled habits in the care of the body which will lead toward stronger, healthier and more efficient lives.

A BRIEF REVIEW OF THE SITUATION IN SAN FRANCISCO OF THE QUESTIONS OF INTEREST TO THE AMERICAN SCHOOL HYGIENE ASSOCIATION.

PHILIP KING BROWN, M. D., PROFESSOR OF MEDICINE, POLYCLINIC POST-GRADUATE SCHOOL, SAN FRANCISCO.

A review of the school hygiene work in San Francisco presents a number of points of interest chiefly in defining the extreme difficulty in the accomplishment of much result where politics and the spoils system vie for supremacy with time honored but wholly antiquated traditions.

About thirty of our public schools were destroyed in the fire of 1906. With one exception, the girls' high school, these were flimsy firetraps, impossible to clean, warm or ventilate in a satisfactory manner. Their destruction had its good side not alone in the complete removal of the buildings but in the subsequent generous provision for the rebuilding of fireproof, modern schools in their places and in a number of instances in the purchase of additional land for larger playgrounds adjoining the schools. Thus far ten have been built and fifteen more are in course of construction.

Two years ago the American School Hygiene Association's representatives in San Francisco endeavored to persuade the board of education, who pass upon the plans for each school, to provide outdoor rooms in each school for the ungraded classes of children in delicate health. At intervals for the past two years further efforts have been made to procure a trial of the open-air classes, thus far without result. In the meantime the same effort is being made by the Tuberculosis Society, through its efficient secretary, Dr. Brodrick, who two years ago as city health officer was found in the front in every movement for better health conditions.

The city health department has made a good beginning in preventive work in providing for a division of school medical inspection consisting of a physician, a dentist and four graduate nurses who are under the Civil Service Commission. The limited number makes it necessary for them to confine their work to nineteen of the eighty-five public schools, and rightly the schools inspected are in the crowded quarter occupied by the poorer part of the population. There is nothing peculiar to San Francisco in the work carried on by this department except that a procedure of such inestimable and plainly demonstrated economic value to the community should not be more appreciated and better supported.

The extraordinary number of mentally deficient children has led to the establishment of a separate school for them, where also are placed in separate classes children of foreign-born parents speaking no English. This is obviously unfair and unwise, particularly as no specially trained teachers are provided for this work.

We are convinced that there should be a more intimate relation between the inspection department and the existing agencies for medical and surgical relief, as well as other forms of help—clinics, parish churches, local police, sanitary inspectors and the benevolent societies. The mere quarantine and control of contacts is a great and life-saving work and in San Francisco the nurses are so crowded with work in several scattered districts that proper control is thus far quite out of the question. It is frequently the case that a child with scarlet fever may be excluded from a primary school and after much inquiry at the home it is discovered that two older children work or go to some school not under medical supervision. In either event they are not under the immediate control of the medical inspection department and the whole point of the service fails. In an uninspected school an epidemic of whooping cough spread nearly through the school because the children with it were allowed to remain in school. Five cases of diphtheria with one death occurred in one class in the same school because a Christian Science mother kept her sick child in school.

Furthermore San Francisco is much handicapped by the kind of teachers who fill the public schools. Far too many of them are in such poor health themselves that they cannot but reflect badly on the children. A teacher so nervous that she cannot control herself can scarcely assist wisely in laying the proper foundations in the lives of the American youth for a stability of the nervous system which should be a matter of great concern at this time. Tuberculosis and nervous prostration are the besetting troubles of any teaching class that should *ipso facto* exclude them from the schoolroom, and there is no excuse for either in the public school system. The difficulty is being met in a small way by an examination by the board of education into the cause of long continued absence from duty of the more seriously afflicted teachers.

This brings up one further important question as to what place hygiene and preventive medicine should occupy in the public school curriculum. It would seem that the fundamental principles of preservation of our natural resources should be taught to the children and that they should grow up intolerant of the prejudices that exist to-day as a serious handicap to the welfare of the race. A knowledge of the value of fresh air in the prevention of tuberculosis and of contagion generally, and of surgical cleanliness in the treatment of wounds instead of the use of cobwebs and dirty

rags, would save many lives annually and promote a standard of living especially among the poor that would operate toward the production of a finer and a hardier race.

The place of play in school life could be made to serve the function of a working laboratory of hygiene and preventive medicine, and if the play could be supervised by teachers who understood its value in the training of the child's mind as well as his body, the result would justify the expenditure of large sums to increase the size of the grounds about our public schools.

THE STATUS OF SCHOOL HYGIENE IN TENNESSEE.

DAVID SPENCE HILL, PROFESSOR OF PSYCHOLOGY AND EDUCATION, PEABODY COLLEGE FOR TEACHERS, NASHVILLE, TENN.

A research into the conditions of school hygiene throughout the length and breadth of Tennessee has not been undertaken by any one. The present paper purports only to present some fair generalizations obtained through extensive observation, and also a few typical and illustrative facts. These will be stated in the following order: 1, The teaching of school hygiene; 2, sanitation of schoolhouses; 3, medical inspection; 4, special health movements and agencies; 5, local obstacles and difficulties; 6, concluding suggestions.

1. *The Teaching of School Hygiene.*

There is little teaching of school hygiene in its technical aspects in Tennessee. The American School Hygiene Association would do well to recognize the difference between ascertaining and teaching hygienic norms on the one hand, and, on the other, the difficulty in putting the same into practice. Even where norms have been established by research it is no easy matter to put these either into courses of instruction or into actual practice.

No one of the four normal schools in Tennessee for which funds have been provided recently by the state will open its doors until September 1911, and the courses of study for these schools have not been worked out in detail. The writer has expressed to the State Superintendent his urgent hope that courses in school hygiene should be supplied. The baleful day of the small, private normal schools run for profit is passing or past in Tennessee. Much is now desired of the new state normals and also of the George Peabody College for Teachers.

The old Peabody College for Teachers (supported by the Peabody Education Fund) has offered during the past year cer-

tain courses which comprised: (a) the hygiene of instruction. This work was given in connection with educational psychology and child study, required of all students during one quarter, five hours per week. (b) The hygiene of the child, with especial reference to communicable diseases. A professor in charge of biological courses gave this elective work. A student sanitation club composed of candidates for teaching has evoked considerable interest and study in the College. (c) The administrative aspects of school hygiene, taught by a professor in education. The preceding courses are in addition to physical training and gymnasium work, required of all students. The early closing of the old Peabody anticipatory to the erection of new buildings on a different site, and to the establishment of the George Peabody College for Teachers in affiliation with Vanderbilt University, ends abruptly these courses in hygiene, at least during the proposed hiatus. It is hoped that the new college will make ample provision for these important studies and for research in school hygiene.

Throughout the state there is considerable instruction given in personal hygiene in connection with the elementary courses in physiology. Doubtless many valuable facts are taught to children in this way, but in the opinion of the present writer it has the objection that much of the teaching of physiology is unscientific. Perhaps too much instruction about health is unnatural for children and likely to promote the development of hypochondria. It tends to supplant habituation, practice, with moralizing. The mere introduction of text books upon elementary physiology and hygiene is not a fair substitute for the putting into practice of more fundamental measures, such as: (1) adequate medical inspection; (2) sanitary school plants; (3) instruction administered by teachers with technical training. Tennessee needs all of these measures to be put into complete operation.

2. *Sanitation of Schoolhouses.*

One can find easily the common drinking cup, illy ventilated schoolhouses, crowded rooms and diminutive spaces for play upon the premises of both the city and rural schools of Tennessee. Dust-spreading methods of removing dirt, and outhouses that offend both eye and nose may be found. It is painful to confess the frequency of these evils; but it is also unfair to assert that such conditions are either typical or wholesale in Tennessee. In fact there is growing a steady reaction away from such things toward the adoption of scientific and ethical procedure.

Two attempts may be mentioned in order to illustrate this reaction in favor of better school plants. (a) From the office of the State Superintendent a book of plans has been distributed throughout the counties and cities. This compendium contains

some excellent plans for several grades of schoolhouses and directions for improved heating, ventilation and illumination. There is a distinct movement in favor of the erection of modern schoolhouses planned after careful consideration and investigations. (b) In the employ of the state and of the Southern Educational Board, State Organizer Miss Virginia P. Moore has traveled through this state in the interest of school improvement associations, the mission of which is "better physical surroundings, good books for all, art in the schoolroom." The writer has read many reports from local associations, some in the mountains, some in the villages, and others from the larger cities, and from these reports the work inaugurated by her seems to be of value in interesting to practical coöperation all of the friends of education —school officials, teachers, pupils, parents and club women. Desultory reading of these reports produces at first an impression of the superficiality in such work, but when one tabulates the number of new schoolhouses built, old wells closed, unsanitary practices revealed and abandoned, of the debates, lectures and readings upon health problems affecting the homes and schools both in the remote, inaccessible districts and also in the cities— the work of Miss Moore seems to be at once pioneer and very fruitful.

3. *Medical Inspection.*

The state has no general law requiring medical inspection of school children. Strong resolutions have been adopted by the following general associations heartily endorsing the principle and calling upon our legislators to pass suitable laws to that effect: the State Dental Association, the Tennessee Federation of Women's Clubs, the Southern Medical Association. The writer has often found eager audiences in urging this measure and very loyal support upon the part of the press.

In Knoxville, Memphis, Chattanooga and Nashville encouraging beginnings have been made in the work of medical inspection of school children, but no full fledged system with sufficient nurses, trained physicians and thorough organization supported by the city or the state exists in Tennessee. The city of Nashville because of its many educational institutions is rightly called the Athens of the South. Her colleges are excellent and numerous, both for the white and negro races; and her commerce is rapidly enlarging. At the center of the state and its capital, this city of about 120,000 inhabitants will be cited to illustrate the development and present status of medical inspection. Some four years ago Mrs. A. B. Cooke and a committee of club women visited a dozen of the city schools, making observations as to water, dusting, ventilation and other arrangements. It was reported that the children placed books on the floor during recitation, that the

common drinking cup was everywhere used and in some cases distilled water "when in order," etc. In 1908-09 regular inspection was introduced by the Board of Education to the extent that vision was tested by individual teachers supplemented by the visits of one medical inspector. In 1909-10 the vision and the hearing tests were given by the teacher; the medical inspector took up the cases referred to him and sent notices to parents and the cases were followed up. During 1909-11 examination of throat and teeth was undertaken. This inspection has uncovered conditions that demand an immediate enlargement of the work. The following is a summary presented by the inspector on December 26, 1910.

Schools	A	B	C	D	E	F	G
Pupils examined	350	169	459	97	248	558	574
Defective vision	22	10	20	1	17	39	39
Crossed eyes	6	4	6	2	3	6	9
Trachoma	25	8	21	9	9	22	23
Other eye inflammations	11	6	11	2	5	18	15
Discharge from ear	2	1	7	0	3	3	8
Frequent earache	10	13	19	5	11	34	31
Enlarged tonsils	34	24	46	6	17	37	35
Defective teeth	86	51	132	30	65	156	178
	196	117	262	55	130	315	338

More inspectors and nurses, more adequate organization and authority for the medical director are being urged by progressive citizens and doubtless will be obtained before long. The lone and active inspector, Dr. E. L. Roberts, deserves considerable commendation for his work done thus far single-handed, save as aided by the teachers.

4. *Special Health Movements.*

One symptom of these tendencies is the effort both before and since the Carnegie Report to raise the standard of medical education. Like some other states Tennessee has been cursed by a few low grade medical colleges, some of which, according to the Flexner description, rival those of Chicago. Encouraging improvements in this direction are manifest at several points.

Again, civic improvement as evinced in campaigns for clean streets, trunk sewers, abatement of fly nuisance, dissemination of knowledge concerning communicable diseases, garbage disposal, sanitation of jails, for the use of smoke consumers, for playgrounds, parks, better highways and beautification of cities and towns are all movements well under way, even if efforts of citizens and of organizations have been at times feeble and the results are not commensurate with the dire need. One accomplishment during the past three years was the practical improvement of the drinking water of the capital city by means of chemicals. The water as taken from the Cumberland River is badly polluted.

The problem of water supply in our cities and towns is crucial, and in some cases will demand radical changes in the sources of supply if permanent safety is to be found. The prevalence of both typhoid fever and tuberculosis is unnecessarily great in this state; the death rate of children under five years of age from intestinal disorders is high.

The state board of health has worked betterment through its efforts to obtain more accurate vital statistics, to fight disease directly, by numerous investigations which have been published, and by educating the masses in matters of health. A state conference of health officers has been held with success, and the work in the state now tends to considerable unity of effort. Bulletins for the information of the people have been scattered broadcast. The investigation of the hookworm disease by Dr. Olin West and his colleagues is resulting in the accumulation of data and the successful treatment of numerous cases, as set forth in illustrated bulletins. The report of this State Board for 1909 sets forth verbatim reports from county and city health officers which describe the source of water supply, the sewer systems, etc., in all the cities and towns of the state. The state pure food and drug Inspector has been active in disseminating information, making tests and securing convictions. Finally, the report contains the following interesting summary of mortality statistics for the white and colored races.

MORTALITY STATISTICS IN THE LARGER CITIES OF TENNESSEE, WITH RATE PER 1,000 ANNUALLY, FROM ALL CAUSES, FOR THE YEARS 1907 AND 1908.

Cities	Population			Total Deaths From All Causes			Annual Rate Per 1,000		
	White	Colored	Total	White	Colored	Total	White	Colored	Total
1907									
Memphis	*84,000	*71,000	*155,000	1,036	1,410	2,446	12.33	19.85	15.78
Nashville	*78,375	*46,394	*124,769	1,041	972	2,013	13.68	20.96	16.13
Chattanooga	*38,000	*17,000	* 55,000	344	285	629	9.05	16.76	11.44
Knoxville	*41,000	*12,000	* 53,000	494	271	765	12.05	22.58	14.43
1908									
Memphis	*84,000	*71,000	*155,000	1,060	1,261	2,321	12.62	17.76	14.97
Nashville	*80,264	*47,455	*127,723	1,074	1,040	2,114	13.38	21.91	16.55
Chattanooga	*38,000	*17,000	* 55,000	286	274	560	7.53	16.12	10.18
Knoxville	*41,000	*12,000	* 53,000	448	205	653	10.93	17.08	12.32

*Population estimated.

The state federation of women's clubs and numerous local clubs have been very energetic in promoting every good health measure. The report of the health chairman of the state shows that towns represented in the Federation have active chairmen and committees. The Tennessee club women during 1909 earned about $8000 for the suppression of tuberculosis. The tuberculosis exhibitions under the supervision of Mr. Routzahn were widely

advertised and attended. The traveling exhibits were sent to twenty-seven county fairs. At the State Fair lectures were also given and 100,000 leaflets were printed for distribution. This work is culminating in the establishment of a tuberculosis hospital by the state. Notable among the items of women's work are these: at Bell Buckle, prizes for cleanliness in colored homes; bubble fountains at Harriman, Paris and Trenton; anti-expectoration ordinances at Jackson, Gallatin and Nashville; sanitary homes for working girls at Jackson; work through Mothers' Association at Knoxville; Maryville, sanitary reforms in jail; Memphis, maintenance of hospitals, visiting nurses, women's sanitary inspector; Sewanee, instruction of mountain women through women missionaries; Morristown, oiled school floors, the abolition of sweeping, etc. In this work in behalf of health, Dr. Lillian Bell Johnson and Dr. Elizabeth C. Kane of Memphis have rendered good service. And especially noteworthy was the employment by the club women of Nashville of an alien investigator and civic revivalist to visit Nashville to look into conditions, criticise and suggest. Mrs. Carolyn Bartlett Crane of Michigan did this work and her published report in many instances is scathing, but on the whole is constructively directive, as it covers the points of her observations about drainage, sewerage, water supply, street cleaning, markets, bakeries, milk and meat supply, playgrounds, housing problems, charitable and penal institutions and school sanitation. The report of this competent woman is serving as a kind of text and inspiration to local reformers. The residence in this city of Nashville of Mrs. S. S. Crockett, now health chairman of the National Federation of Women's Clubs, is an aid to the work of the women in behalf of health. Mrs. John Hill Eakin of the Centennial Club of that city has now on foot a first-hand investigation into the practicability for Tennessee of the psychological clinic as in use at the University of Pennsylvania under Dr. Witmer.

4. *Local Obstacles and Difficulties.*

First, the obstructionist sometimes makes his presence felt. There is a house, I have been told, near the Tennessee-Carolina line, which sags on the east side, on the west side, in front and behind, and the roof is concave downward. It was never built right. Hickory poles prop up the house in front, behind, on the sides. In like manner vicious dogmas of superstition and attitudes of indifference concerning hygiene are being propped up by all kinds of makeshift arguments, where the modern investigator, physician and trained teacher demand revolution in social habits. For example, in education the dogma of formal discipline, in unmodified form, namely, that all-round mental and moral effects accrue invariably from special drill in certain favored courses of study, together with certain other superstitions inherited from

asceticism, is yielding stubbornly to the onslaught of experimental pedagogy. But there are also other obstacles to progress in public and in school hygiene. The geographical conditions, the distribution of the population and the history of the proud achievements of the people of Tennessee under adverse circumstances—all show that the present status of sentiment and of practice with regard to scientific measures of racial protection is even greater than might have been expected from a less vigorous people.

The extreme breadth of the state, 430 miles, presents manifold topographical features, as in the mineral and rugged mountain regions of the East, the hills and plains of Middle Tennessee and the forest, lakes and swamps of West Tennessee. Two lengthy rivers traverse the state. Rich in coal, iron and phosphate rock, marbles and stone, abundant in cotton and other agricultural products, the state is in a process of material growth that absorbs the energy of her people. The area of the state is five times greater than that of Massachusetts, but the population (1900) is three fourths as great. The density of population compared with Massachusetts is as 48.4 compared with 348.9. A unique opportunity exists in Tennessee to put to the test educational principles based upon research, as they might affect the development of a race of distinctly American people. The vast majority of the people in Tennessee were born in that state. The ninety-six counties exhibit some variation in group peculiarities of speech, occupation and tradition, but the population as a whole is American. Ninety-nine and one tenth per cent are native born as compared with 69.8 per cent in Massachusetts. In Tennessee 1.9 per cent of the population have parents both foreign born: in Massachusetts 53.2 per cent have both parents foreign born. (See Abstract, U. S. Census, 1900, pages 42-46.)

These few facts are relevant in order to illustrate not only the plastic condition of Tennessee as promising great possibilities of progress in human development, but also the fact that it is futile to assume similar conditions in states that are remote when we attempt to apply generalized educational rules, without modification, to meet local conditions.

Space does not permit a further enumeration of the facts concerning our progress and our delays during the past decade, as educators have confronted also the peculiar difficulties of scarcity of money, illiteracy, political complications and the burden of supporting two school systems, one for the white and one for the negroes. The struggle for the essentials of existence, a necessity augmented by the disasters of the Civil War, and the added burden of the negro race, have consumed the life of our people. By-products of social development have been the intense political battles and ecclesiastical contentions which, alas, have consumed too much of our energy.

We have seen that, with respect to the modern health movement, public sentiment in Tennessee during recent years has been very much alive. When one considers the background of obstacles and difficulties sketched above it is not surprising that the status of school hygiene is incapable of a satisfactory description or generalization, so far as being characteristic of the whole state.

There are issues enough in the South, and in the North, to challenge the zeal of a Paul. From different points of view each of us may urge the crucial importance of some one of the issues in the South, such as: the status of the child and the woman toiler, factory sanitation and inspection, the control of communicable diseases, the lack of public bathhouses and playgrounds in our cities, the revision of statutes relating to the age of consent, the erection and proper management of juvenile reformatories in order to end the sending of boys to state penitentiaries, the need of psychological clinics and of intelligent care of the exceptional child of the schools, the social necessity of the segregation of the feeble-minded, the demand for occupation teaching, for industrial and agricultural schools for the masses who never enter the high school (who, in fact, leave the grammar schools before reaching the sixth grade). Or, finally, the need of compulsory education is emphasized. We can not achieve at once all of the needed reforms. As a citizen and native of the state and as a student of educational problems I hazard by way of conclusion two constructive suggestions for first steps that bear directly and fundamentally upon the problems of the health of school children in our state.

1. There is a need of concrete, specific and practical plans to be brought before our municipal and state authorities, in order that public sentiment now active in a score of disparate activities may be crystallized and put to work. We have passed the time for adopting resolutions. It is unfortunate if such plans should emanate either from muckrakers seeking abhorrent details here and there, in order to weave them into the fabric of morbid recitals, or from that type of reformer who is ever ready to enlist under the banner of altruism so long as there appears the prospect of a coming kingdom where self may be exploited.

In order to formulate lasting measures suited to local conditions, geographical and social, data such as could be got by municipal or private bureaus of child-research are needed both for guidance of authorities and also for the education and nurture of public sentiment in regard to the health of children. To cultivate a public sentiment is as necessary as to pass a law. Such bureaus could coöperate with the proposed federal bureau as Washington with mutual benefit.

2. The adoption of a state law in favor of the medical inspection of all school children and schoolhouses seems to be a safe first step and a natural correlative of compulsory education

which is now being agitated. While these lines are being written measures to this end are being formulated for presentation to our legislature, now in session. The effort seems also to be particularly opportune in the present great revival of interest in public education in Tennessee, when high schools are being multiplied, and normal schools supported entirely by the state for the first time are being established.

SCHOOLHOUSES AND THE LAW.

FRANK IRVING COOPER, ARCHITECT, BOSTON.

In Boston on the morning of October 21 of last year 650 school children marched from a burning school building over stairways where the smoke was coming up through the cracks.

Not quite three years ago school children in Collinwood, Ohio, marching down the stairs of a burning school building, became panic stricken and 174 of these little children died within sight and in some cases within touch of their agonized parents.

Collier's Weekly of March 21, 1908, called the Collinwood fire "A National Crime," and the entire country was aghast over the appalling results which came from faulty planning and construction.

The American people were aroused by this slaughter of school children and at once demanded that school buildings be investigated and examined by experts. This investigation showed that many of these buildings were firetraps and the discovery led to appropriations of money that there might be no excuse for the recurrence of such a disaster as had taken place at Collinwood.

But the people saw that merely to appropriate money for the renovating of old school buildings, for the erecting of fire escapes or for replacing wornout and leaky heating plants with new was not enough; more must be done if new school buildings were not to be erected in the same old way. So the people prepared for the legislative sessions many bills bearing on the construction of school buildings and a mighty effort was made throughout the country to have conditions bettered.

The bills were safely introduced but meanwhile other interests, interests that desired no change, worked to postpone action and in the ambuscades and coverts of legislative procedure these interests were able to sidetrack this supremely important legislation. The efforts of the people, of the parents compelled by law to send their children to pass a half of each day in buildings erected by committees ignorant of all rules of safe construction, remained for the most part fruitless. The old careless way, favored by

CHART SHOWING STATUS OF COMPULSORY REGULATION OF SCHOOLHOUSE CONSTRUCTION IN THE UNITED STATES IN 1910.

COMPILED BY - FRANK IRVING COOPER, BOSTON.

			PLAN							CONSTRUCTION							FIRE PROTECTION				SANITATION				FURNISHINGS		
STATE	HEALTH	EDUCATION	APPROVAL	EXITS	STAIRWAYS	FIRE ESCAPES	DOORS	SCHOOLROOMS	LIGHTING	AISLES	FRAME	COMPOSITE	FIREPROOF	FIREPROOF STAIRWAYS	DOOR LOCKS	ELECTRIC WORK	GAS FITTINGS	FIRE ALARMS	FIRE APPARATUS	CONSTRUCTION	HEATER ROOM	HEATING	VENTILATION	SANITARIES	WATER SUPPLY	DESKS	SEATS	BLACKBOARDS
ALABAMA		X	▨																									
ARIZONA																												
ARKANSAS																												
CALIFORNIA		X	■			■			▨													▨	▨					
COLORADO																												
CONNECTICUT				■	■		■					■	■	■	■			■			■			■				
DELAWARE	X																					▨	▨	▨				
FLORIDA																												
GEORGIA																												
IDAHO																												
ILLINOIS																												
INDIANA	X							■	■													■	■	■				■
IOWA		X	■																									
KANSAS SEE NOTES A D			■	■	■	■	■												■		■							
KENTUCKY																												
LOUISIANA																												
MAINE	X	X	■	■	■	■	■	■	■													■	■					▨
MARYLAND																												
MASSACHUSETTS			■	■		■				SEE NOTE B					■				■	▨	■	■	▨	■				
MICHIGAN SEE NOTE C	X					■		■	▨													▨	▨					
MINNESOTA	X	X	■					■	■													■						
MISSISSIPPI																												
MISSOURI																												
MONTANA	X								▨													▨	▨	▨				▨
NEBRASKA																												
NEVADA																												
NEW HAMPSHIRE		X				▨	▨																					
NEW JERSEY		X	■		■		■	■						■								■						
NEW MEXICO																												
NEW YORK		X	■	■	■	■	■	■	▨	▨												■						▨
NORTH CAROLINA																												
NORTH DAKOTA	X	X	■			■																	■					
OHIO SEE NOTE D			■	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨		▨	▨	▨
OKLAHOMA																												
OREGON																												
PENNSYLVANIA		X				■		■														■	■	■				
RHODE ISLAND		X				■	■																					
SOUTH CAROLINA																												
SOUTH DAKOTA		X	■				■		▨													■	▨				▨	▨
TENESSEE																												
TEXAS																												
UTAH	X		■		■		■	■	■													■					■	
VERMONT	X		■		▨	▨	▨	▨	▨	▨												▨	▨	▨	▨	▨	▨	▨
VIRGINIA		X	■		■		■	■	■	■												■	■				■	
WASHINGTON																												
WEST VIRGINIA			▨																									
WISCONSIN																												
WYOMING																												

X INDICATES DEPARTMENT CONTROLLING THE ENFORCEMENT OF THE LAWS

NOTE A. THE PLANS FOR SCHOOL BUILDINGS IN THIS STATE MUST BE APPROVED BY STATE ARCHITECT

NOTE B THESE RULES ARE PREPARED BY THE DEPARTMENT OF INSPECTION OF WORKSHOPS FACTORIES AND PUBLIC BUILDINGS

NOTE C. THESE LAWS AND REGULATIONS APPLY TO STATE BUILDINGS ONLY.

■ INDICATES LAW ▨ INDICATES REGULATION

the interests, continued to be the rule and a recent return states that on an average 156 school buildings are burned to the ground every year. In these 156 examples of American construction, just how many children have passed one half of their time in eminent danger of a repetition of the experience of the Collinwood children would be valuable information could it be accurately established.

During the past summer I have made an investigation of the state laws and regulations of the states of the United States of America in regard to schoolhouse construction and the result is here shown in chart form.

In looking over this chart the reader at once notices these startling facts: so far as can be ascertained only eight states have passed laws worthy of the name bearing on schoolhouse construction. Of this number only two states have regulations on fireproof construction and of this number only one state, Massachusetts, has passed regulations on fire-retarding construction. Sixteen states have passed regulations controlling the plan, but of forty-eight states of our country twenty-two states have no laws or regulations whatever to prevent school buildings being built as crematories.

In a majority of cases the laws as they have been passed state that plans for school buildings must be submitted to a superintendent or other authority for approval.

This means a control by men and not by law, it opens the way to corruption and favoritism or at best to regulations that change with the ideas or change of administrators. Regulations for the construction of school buildings should be specific and should be the law of the land. The present tendency to put the responsibility of making the law on the shoulders of inspectors, commissioners or trustees and the tendency to allow each subauthority to make rules for his own district should be stopped.

Each state should pass school-building laws to govern the construction of all of its school buildings, and these laws should be administered by a strong central authority with as many inspectors as may be needed to cover the work.

The State of Massachusetts expends nearly two and one half million dollars each year for the erection of new school buildings. What Massachusetts is doing other states in the Union are doing, and this great expenditure of money is being made for the most part without control by law.

Does the present situation show the intent of the American people? Does the wonderful perfection of the schoolhouse fire-drill, the skill and the heroism of American fire departments, aided by automatic alarms and signals, excuse the public authorities for such school buildings as are now being erected throughout our land?

There are few communities which would allow plumbing pipes and fixtures to be installed without expert advice. It is here worthy of note that leading manufacturers and wholesale merchants of plumbing supplies spend large sums each year in campaigns of education with the trade and with the public to the end that goods made on right lines shall be installed in a right way. The law gives the boards of health supreme power to correct plumbing installations that have been made in defiance of hygienic rules.

Yet the danger caused by faulty building is no less grave and the people are ready for the passing and enforcing of regulations that will promote the erection of right and sane school buildings.

Some of the states have already placed laws upon their statute books as I have shown; most noteworthy among them is the State of Ohio, whose legislature passed last May an act relating to the preparation of a code of regulations to govern the erection of public buildings.

HOUSE BILL No. 258.

AN ACT.

Relating to the preparation of a code of regulations to govern the erection and maintenance of public and other buildings.

Whereas, The State Departments of Workshops and Factories, State Fire Marshal and State Board of Health have met with opposition and embarrassment in the performance of the duties pertaining to those departments with respect to the construction, safety and sanitary conditions of public and other buildings, and

Whereas, Such opposition and embarrassment have arisen because of inadequate statutory provisions relating to those subjects, and

Whereas, Great loss of life, health and property have resulted because of the lack of proper statutory building regulations, now therefore,

Be it enacted by the General Assembly of the State of Ohio.

SECTION 1. That the Secretary of the State Board of Health, State Fire Marshal and Chief Inspector of Workshops and Factories be, and they are hereby empowered and required, acting conjointly, to cause to be prepared and submitted to the next session of the General Assembly a code of regulations with respect to the construction, safety, sanitary conditions and maintenance of public and other buildings, and to that end may employ such assistants as they deem necessary; provided, however, that the total expense incurred in the employment of such assistants shall not exceed the sum of two thousand five hundred dollars.

GRANVILLE W. MOONEY,
Speaker of the House of Representatives.

FRANCIS W. TREADWAY,
President of the Senate.

Passed May 10, 1910.

Approved May 13, 1910.

JUDSON HARMON, Governor.

The people of other states should demand similar action by their representatives and the efforts of the fire protection asso-

ciations, fire engineers, insurance engineers, architects and building inspectors should be so directed that their united energy would concentrate on the law makers.

Central committees should be formed in each state representing all parties concerned in this movement and work directly to the end in view. These committees should institute lines of research, should collect all possible data and should so tabulate their information that they would know what was being done in all other states. They should also keep this information constantly up to date in order that no regulation should be passed without a clear understanding of the result of similar regulation in other states.

Laws suitable for construction in the wintry northern states must of necessity be different from those drawn for the milder conditions prevailing in our southern states.

The conditions demanding fireproof construction for our cities and larger school buildings are not found in rural communities and this should be borne in mind when framing general laws. Forms of construction that will give conditions that greatly retard the spread of fire are well known, are approved by fire underwriters and are suitable for the situations away from congested districts.

The task of drawing construction laws is one for the consideration of each state by itself. No law should be passed that does not meet the approval of experts connected with insurance associations, of architects and contractors experienced in schoolhouse construction, and of building inspectors and chiefs of fire departments working in the states where the law is to be enforced.

I have referred to an investigation made by me last summer into the legal status of schoolhouse construction. This investigation was made possible through the assistance of health, education and inspection departments of the various states. I add a digest of the information sent in the hope that it may prove of use to others interested in the bettering of schoolhouse building.

STATE OF CALIFORNIA.

SCHOOL LAW.

Article III. School Superintendents.

All boards of trustees, before adopting any plans for school buildings, must submit the same to the county superintendent for his approval.

Article XX. Fire Escapes.

Each school building in the state shall, if two or more stories in height, be provided with suitable and sufficient fire escapes.

STATE OF CONNECTICUT.

PUBLIC ACTS.

Chapter 81, Section 2.

No schoolhouse for the accommodation of pupils of grammar school grade, or of a lower grade, shall be constructed so as to contain more

than two stories above the basement. No schoolhouse for the accommodation of pupils of a higher grade than grammar school grade shall be constructed so as to contain more than two stories above the basement, unless such schoolhouse is of fireproof construction throughout, and in that event shall not exceed three stories above the basement.

Chapter 81, Section 3.

All schoolhouses of eight or more classrooms not of fireproof construction throughout shall be built as follows: (a) The outer walls shall be of brick, natural or artificial stone, terra cotta blocks, reënforced concrete, or other fireproof material. (b) The walls separating schoolrooms from the halls or corridors shall be of masonry or other fireproof material. (c) There shall be a stairway constructed in at least two opposite sides of the building leading to the ground floor from the floor or floors above, and no such schoolhouse hereafter built shall contain circular stairs. (d) There shall be one exit constructed in at least each of two opposite sides of the building upon the first floor leading to the ground, which may be the same as the exits from the floor or floors above the first. (e) The stairs and stairways shall be of fireproof construction. (f) All doors leading from rooms into halls or corridors shall be hung so as to swing into the hall or corridors, and all doors leading from the corridors out of the building shall be hung so as to swing outward. (g) There shall be a door of fireproof material at the head of each stairway leading from the first floor to the basement. (h) All wooden partitions, ceilings, floors and woodwork about the heating apparatus or plant shall be covered with asbestos, tin, sheet iron, or other fireproof material so as to effectually overcome danger from fire.

Chapter 126, Section 1.

Every schoolhouse or hall, excepting town halls, in which people commonly assemble in larger numbers than one hundred, shall be provided with one or more exits, each exit consisting of a door so hung as to open outward, and in case any passageway from such schoolhouse or hall to such exit contains one or more doors, each door shall be hung so as to open outward.

State of Indiana.

Rules of State Board of Health.

In this state the Board of Health has ordered provisions to prevent the rise of dampness in schoolhouse walls and that basements shall be drained, ventilated, and lighted. They also order that school buildings be heated to seventy degrees during zero weather and that there shall be fifteen feet of floor space per pupil in each room. Light shall be admitted from one side of the schoolroom only and fall over the left shoulder of the pupils and the windows shall be one sixth of the floor area. Walls are to be painted neutral color and the blackboards are to be dead black. Well lighted, heated and vented cloak rooms are ordered provided for the sexes.

State of Kansas.

School Inspection Law.

Under Chapter 209 of the School Inspection Law it is provided that doors shall remain unlocked while school is in session and that they shall open outward. Every story above the first is to have two or more exits distinct from the exits of the lower floor. Ceilings above heating apparatus are to be protected.

No school building is to be erected without approval of the plans by the state architect.

STATE OF MAINE.

Chapter 88, Public Laws, 1909, provides that when plans have not been prepared for schoolhouses by the state superintendent, suitable provision shall be made for the heating, lighting, ventilating and hygienic conditions and the plans be submitted to and be approved by the state superintendent and the State Board of Health.

STATE OF MASSACHUSETTS.

DISTRICT POLICE.

General Recommendations and Specifications under the Requirements of Chapter 104, Revised Laws.

Chapter 104, Revised Laws of Massachusetts, and amendments thereto, provide that a building which is used in whole or in part as a schoolhouse shall have proper and sufficient egresses or means of escape from fire, and located as far apart as practicable. All egress doors to open outwardly, and, where necessary to fasten, the standing leaf of each pair of doors should have face bolts, operated at top and bottom by a turn handle or lever, and single doors should have night latches, operated by a turn handle or knob. All the above to be operated from the inside, within four feet of the floor, and all other bolts, dead locks and hooks to be removed.

All stairways should have handrails on each side and all egresses to be provided with a sign having on it the word "EXIT" in letters at least five inches in height, and so as to plainly indicate to the persons within the building the location of such egresses. Smoke doors dividing corridors should swing each way, with suitable spring hinges, and without bolts or other fastenings.

All schoolhouses more than two stories in height, each story above the second story, should have a standpipe and hose, or other approved means for extinguishing fire.

The law requires that a copy of the plans of every public building and every schoolhouse except in the city of Boston, shall be deposited with the inspector of factories and public buildings of the district in which such building is located, before the erection of the building is begun, which plans shall also include the system or method of ventilation to be provided, together with such portion of the specification as the inspector may require.

In planning buildings to be used for schoolrooms, or places of assemblage above the first story, provision should be made for at least two stairways, and such stairways should be as far apart as practicable. No such stairways should be more than four feet wide in the clear. No flight of stairs should be more than fifteen steps between landings.

All outside doors to such buildings should open outwardly and be plainly so shown on the plans. The standing leaf of all pairs of doors leading to ways of egress should be fastened by face bolts, operated at top and bottom by one handle, at a convenient height from the floor.

All elevator wells and light shafts, unless built of brick, must be filled in flush between the wooden studs with fireproof materials and lined with metal or plastered on metalic lathing, as may be directed by the inspector, and all woodwork inside of such wells or shafts be lined with tin plate lock-jointed.

Where floor beams rest on partition caps or on girders, girts, or on wooden sills, fill in between such beams, from the caps, girders, girts or sills, to four inches above the plaster ground, solid with brick and mortar or other fireproof material

Where floor beams in frame buildings rest on ledger boards, fire-stop thoroughly at each floor with brick and mortar resting on bridging pieces

cut in between the studs, or, where practicable, on the ends of lining floor.

In brick buildings the space between the furrings on the outside wall or on brick partitions should be filled flush with mortar for a space of five inches in width above and below the floor beams of each story.

Where basement or other flights of stairs are enclosed by partitions of brick or wood, the spaces between the studs or wall furrings must be so fire-stopped with brick and mortar as to effectually prevent any fire from passing up between such studs or furrings back of the stair stringers.

The soffits of all such enclosed stairs, and also partitions on stairway side, must be plastered on metal lathing.

All long flights of stairs to have smoke stops in each flight properly constructed.

No pipes for conveying hot air or steam can, under the law, be placed nearer than one inch to any woodwork unless protected to the satisfaction of the inspector by suitable guards or casings of incombustible material.

No wooden flue or air duct of any description can be used for heating or ventilating purposes.

A space of at least one inch to be left between all woodwork and the chimneys, also around all hot air, steam and hot water pipes; these spaces around chimneys and pipes, where they pass through floors, to be stopped with metal or other fireproof material, smoke-tight. Steam and hot water pipes to have metal sleeves and collars.

All channels and pockets for gas, water and soil pipes to be made smoke-tight at each floor.

The space around all metal or brick ventilating ducts must be so fire-stopped at each floor with metal or other fireproof material, as approved by the inspector.

All chimneys to be plastered with one good coat of brown mortar, on the outside of brickwork, from cellars to roof.

The ceiling of furnace or boiler and indirect radiator rooms must be plastered on metal lathing. There should be not less than one foot in height of open air space between the tops of furnace or boiler casing or any smokepipe and the ceiling.

The entire cellar ceiling of schoolhouses and other buildings used for public purposes must be plastered on metalic lathing.

State of Michigan.

Board of Public Health.

The State Board of Health recommends that all flues be of brick or galvanized iron.

State of Minnesota.

State Board of Health.

Regulation on Construction of Buildings.

Whenever it is proposed to build any school, hospital, almshouse, prison or other public institution, the plans and specifications for same in respect to sanitary conditions shall be submitted to and filed with the Minnesota State Board of Health, and no such building shall be constructed until the sanitary arrangements of the same have been approved by the said board.

State Board of Education.

Construction of School Buildings.

No schoolroom or classroom, except an assembly room, shall have a seating capacity that will provide less than eighteen (18) square feet of

floor space and two hundred and sixteen (216) cubic feet of air space per pupil, and no ceiling in buildings hereafter to be erected shall be less than twelve (12) feet from the floor.

A system of ventilation, in order to be approved by the Minnesota State Board of Health, shall be capable of furnishing not less than thirty (30) cubic feet of air per minute for each person that the room will accommodate when the difference of the temperature between the outside air and the air in the schoolroom shall be thirty (30) degrees F. or more.

In a gravity system of ventilation in connection with a furnace or steam plant, the flues for admitting fresh air to the room shall have a horizontal area of not less than one square foot for every nine persons that the room will accommodate.

The flues for a plenum fan system of ventilation shall have a horizontal area of not less than one foot for every fifteen (15) persons that the room will accommodate. The ventilation of school buildings by this system shall be so designed that the air pressure in any classroom shall be in excess of that of the outside air.

The direct-indirect system of ventilating shall not be used. By direct-indirect is meant the introduction of cold air from the outside of the building at the base of a "direct" radiator.

The glass area of windows shall equal one fifth of the floor area of the schoolroom.

In all rooms not exceeding twenty-five (25) feet in width, all the light shall be admitted to the left of the pupils when seated.

In rooms exceeding twenty-five (25) feet in width, all the light shall be admitted to the left and rear of pupils when seated.

Transluscent instead of opaque shades shall be used in the windows for controlling the light.

The top of windows shall be as near the ceiling as the mechanical construction of the building will allow.

No cloakroom shall be less than six (6) feet wide, nor shall it have less than one window.

The so-called "sanitary wardrobe" which allows the foul air of the room to pass through the clothing of the children before passing into the vent duct shall be condemned as unsanitary.

One-room and two-room buildings heated by hot air, stoves or furnaces shall have a cold air intake, the cross section of which is equal to 0.004 of the floor area of the room or rooms heated. The vent flue shall have a net area equal to that of the cold intake.

State of New Jersey.

Board of Education.

Approval of Plans by State Board.

In order that due care may be exercised in the heating, lighting, ventilating and other hygienic conditions of public school buildings hereafter to be erected, all plans and specifications for any such proposed school buildings shall be submitted to the State Board of Education for suggestion and criticism before the same shall be accepted by the board of education of the district in which it is proposed to erect such building.

Doors to open outwardly.

In any schoolhouse of two or more stories in height, doors leading from classrooms to the corridors and from said corridors to the street or to the ground shall open outwardly.

Light.

Light shall be admitted from the left, or from the left and rear of

the classrooms, and the total light area must, unless strengthened by the use of reflecting lenses, equal at least 20 per cent of floor space.

Stairs.

All stairs, except cellar stairs, shall be not less than four feet in width and shall have intermediate landings. The several flights of stairs shall be enclosed by brick walls or by partitions of slow-burning construction, and without open well holes.

Every schoolhouse having eight rooms shall have two flights of stairs of not less than four feet in width.

Every schoolhouse having sixteen or more rooms shall have three flights of stairs.

Construction of ceilings.

Every building more than one story in height shall have metal ceilings.

STATE OF NEW YORK.

EDUCATION LAW.

Section 451. Plans and specifications of school buildings must be approved by Commissioner of Education.

2. The Commissioner of Education shall not approve the plans for the erection of any school building or addition thereto or remodeling thereof unless the same shall provide:

a. At least fifteen square feet of floor space and 200 cubic feet of air space for each pupil to be accommodated in each study or recitation room therein.

b. For securing at least thirty cubic feet of pure air every minute per pupil, and

c. The facilities for exhausting the foul or vitiated air therein shall be positive and independent of atmospheric changes.

Section 452. Halls, Doors, Stairways, Staircases, etc.

All exit doors shall open outwardly, and shall, if double doors be used, be fastened with movable bolts operated simultaneously by one handle from the inner face of the door.

No staircase shall be constructed with winder steps. No door shall open immediately upon a flight of stairs.

STATE OF NORTH DAKOTA.

GENERAL SCHOOL LAW.

Section 829.

The school board shall consult with the county superintendent of schools and the county superintendent of health with regard to plans providing for the proper construction, lighting, heating and ventilation.

Chapter 124, Section 1. Fire Escapes Required.

STATE OF OHIO.

Building Code.

DEPARTMENT OF INSPECTION OF PUBLIC BUILDINGS.

Classification According to Construction.

First-class Construction. Fireproof Buildings.

This classification includes such buildings as are built entirely of incombustible, fire and waterproof material, with all metal structural

parts thoroughly fireproofed, except that the floors, doors, windows and the usual trim of rooms are of ordinary construction.

Second-class Construction. Composite Buildings.

This classification includes such buildings as have the enclosing walls and roof covering of incombustible materials with doors, windows and frames of wood, and the interior walls of brick; or, columns and girders made of fireproofed iron and steel; the floor construction of wooden beams.

In buildings of this class a single thickness of metal lath or furring and hard incombustible plaster will be deemed sufficient protection for iron and steel columns and girders.

Third-class Construction. Frame Buildings.

This classification includes such buildings as have the inclosing and interior partition walls constructed entirely of wood. Wood frames covered with a veneer will be included in this class.

Classification required according to height.

Where the basement ceiling is 6′ 0″ (six feet no inches) or more above the grade line, the basement will be rated as the first story.

All buildings over two stories in height shall be of No. 1 (fireproof) construction.

All buildings two stories or less in height (except buildings of the third class) shall be of No. 2 (composite) construction.

All buildings one story high, without basement and with the floor line not over 3′ 0″ (three feet no inches) above the grade line, can be of No. 3 (frame) construction.

Auditoriums.

Any room where more than one hundred (100) persons can congregate will be considered an assembly room.

No assembly room can be located above the second story in buildings of the first class, above the first story in buildings of the second class or in any buildings of the third class.

One balcony may be used in connection with auditoriums providing the same has means of egress in the same proportion as called for for schoolrooms.

Dimensions of School and Class Rooms.

The minimum floor space per pupil is to be as follows:

Primary grades 12 (twelve) square feet per pupil.

Grammar grades 16 (sixteen) square feet per pupil.

High schools 18 (eighteen) square feet per pupil.

Height of stories.

Basement play and toilet rooms to be not less than eight feet high.

Classrooms 20′ 0″ (twenty feet no inches) wide and less, 11′ 0″ (eleven feet no inches) story.

Classrooms from 20′ 1″ (twenty feet one inch) to 24′ 0″ (twenty-four feet no inches) wide, 12′ 0″ (twelve feet no inches) story.

Classrooms 24′ 1″ (twenty-four feet one inch) to 28′ 0″ (twenty-eight feet no inches) wide, 13′ 0″ (thirteen feet no inches) story.

Heater Room. For Buildings of First and Second-class Construction.

Furnaces, hot water heating boilers and low pressure steam boilers may be located in the basement providing the heating apparatus, breeching, fuel room and firing room are inclosed in fireproof apartments, with masonry walls not less than 1′ 1″ (one foot one inch) thick; with ceiling of reënforced concrete, brick or hollow tile arches, and pro-

vided with a self-closing (not automatic) fire door of a type as approved by the National Board of Fire Underwriters.

Exits. Buildings of First-class Construction.

Exits from rooms in the superstructure shall be in the proportion of 30″ (thirty inches) in width to every fifty persons or fraction thereof but in no case shall an exit be less than 3′ 0″ (three feet no inches) nor more than 6′ 0″ (six feet no inches) wide.

No fire escape or stair towers will be necessary in buildings of first class construction and all exits shall lead to the corridors.

Each basement room shall have a direct exit not less than 3′ 0″ (three feet no inches) wide, with stone, cement or iron stairs leading up to the grade line; area ways around stairways shall have substantial handrails and guards on both sides. These exits to be in addition to the usual service stairways and means of egress.

Buildings of Second-class Construction.

Each room in superstructure used by pupils or the public, shall have at least two separate and distinct means of egress.

Two doors or openings leading into the same hall or corridor will be considered as only one means of egress.

Communicating doors between any two classrooms will not be considered as a means of egress.

The proportion of exits to the seating capacity shall not be less than 30″ (thirty inches) to each fifty persons or fraction thereof. One half of the exits shall lead to the main corridors, and the other half to fire escapes or inclosed fireproof stairways. No exit shall be less than 3′ 0″ (three feet no inches) or more than 6′ 0″ (six feet no inches) wide. Each room in the basement shall have a direct exit not less than 3′ 0″ (three feet no inches) wide, with stone, cement or iron stairs leading up to the grade line.

Area ways around such stairways to have substantial handrail and guardrail on both sides.

These exits to be in addition to the regular service stairways and means of ingress.

Stairways. Buildings of First-class Construction.

Buildings of first-class construction shall have at least two stairways located as far apart as possible; the same to be continuous from the grade line to the topmost story. No further means of egress will be necessary.

Stairways must be separated from main corridors by self-closing doors at each story.

Buildings of First and Second-class Construction.

No basement stairways shall be placed under nor within twenty feet of any stairway from the first to the second story, except under the following conditions, viz. basement stairs may be placed under a first-story stairway only when a grade line platform open to the air is inserted and no direct connection is made between the stairway below the platform and the one above the same.

Inside stairways from the basement to the first story shall be inclosed in masonry walls not less than 1′ 1″ (one foot one inch) thick, with fireproof ceiling or soffit above and be provided with a self-closing fire door, as approved by the National Fire Underwriters, which shall be placed at the head and foot of the stairway; the steps shall be of iron or concrete.

Width of stairway shall be at the rate of 30″ (thirty inches) per hundred persons or fraction thereof.

No stairway shall be less than 3′ 6″ (three feet six inches) nor more than 6′ 0″ (six feet no inches) wide; or less than three or more than sixteen risers in any run.

No stairway shall have winders and all nosings shall be on a straight line.

Maintain a uniform width in all stairways and stair platforms by rounding the corners and beveling the angles.

Provide handrails on both sides of all stairways and steps.

Stairways shall have a uniform rise and tread in each run, viz.:

Primary schools to have not over 6″ (six inches) rise or less than 11″ (eleven inches) tread.

Grammar schools to have not less than 6½″ (six and one half inches) rise or less than 11″ (eleven inches) tread.

High schools to have not over 7″ (seven inches) rise or less than 10½″ (ten and one half inches) tread.

The above dimensions to be the cut on the stair horse.

All treads to be covered with rubber or lead mats.

Inclosed Fireproof Stairways. To be Used in Buildings of Second-class Constructon.

Emergency stairways shall be enclosed in masonry wall not less than 1′ 1″ (one foot one inch) thick with brick, hollow tile or reinforced concrete floors, platforms and ceilings, and with iron, stone, or concrete steps; and provided with a sufficient number of windows to properly light the same.

No open risers can be used.

There shall be no basement openings into space under inclosed fireproof stairways.

The same enclosure can be used for more than one stairway providing there is no direct connection between any two stairways or stories.

Width of stairs shall be at the rate of 30″ (thirty inches) per hundred persons or fraction thereof. No stairway shall be less than 3′ 6″ (three feet six inches) nor more than 5′ 0″ (five feet no inches), or have less than three or more than eighteen risers in any one run.

No winders shall be used and all nosings shall be on straight lines.

Maintain a uniform width in all stairways and stair platforms by rounding the corners and beveling the angles.

Provide gas pipe handrails on both sides of stairways.

Stairways shall have a uniform rise and tread in each run, viz.:

Primary schools to have not over 6″ (six inches) rise or less than 11″ (eleven inches) tread.

Grammar schools to have not over 6½″ (six and one half inches) rise or less than 11″ (eleven inches) tread.

High schools to have not over 7″ (seven inches) rise or less than 10½″ (ten and one half inches) tread.

The above width of tread to be measured from nosing to nosing.

Treads shall have roughened surfaces.

Exit Doors. For Buildings of First, Second and Third-class Construction.

Exit doors shall be not less than 3′ 0″ (three feet no inches) wide, swing outward (viz. towards the open), and be so hung as not to interfere with passageways or close other openings.

No double-acting doors will be permitted.

Construction.

No nine-inch wall can be used over ten feet high, except for flues.

Cover all floor joists with rough subfloor as soon as the joists are laid.

In calculating construction the superimposed load on classroom floors must be assumed at 60 (sixty) pounds per square foot uniformly distributed and for halls, auditoriums, stairs and corridors it must be assumed at 80 (eighty) pounds per square foot uniformly distributed.

Hardware.

All entrance, exit and emergency doors shall be equipped with hardware of such nature as to be unlockable from within.

No top and bottom door bolts will be permitted.

Single doors to fire escapes, inclosed stair towers and emergency exits from basement shall be fitted with one knob latch (without key) or equivalent.

School room doors shall have knob, latch (without key) or equivalent.

Double doors shall have one double expansion bolt.

The only doors in the building that may have key locks will be one main entrance door, library door, closets and boiler room doors.

State of Pennsylvania.

Common School Law.

CXXI. No schoolhouse shall be erected by any board of education or school district in this state, the cost of which shall exceed four thousand dollars ($4000) until the plans and specifications for the same shall show in detail the proper lighting, heating and ventilating of such building.

Light shall be admitted from the left or from the left and rear of classrooms, and equal at least 25 per cent of the floor space.

Schoolhouses shall have in each classroom at least fifteen square feet of floor space, and not less than two hundred cubic feet of air space per pupil, and shall provide for an approved system of indirect heating and ventilation. Not less than thirty cubic feet of air shall be supplied for each pupil, and warmed to maintain an average temperature of 70 degrees Fahrenheit during the coldest weather.

State of Utah.

School Legislation.

Section 1823. School Sites and Buildings.

No schoolhouse shall hereafter be erected until the plans and specifications of the same shall have been submitted to a commission consisting of the state superintendent of public instruction, the secretary of the State Board of Health, and an architect to be appointed by the governor, and their approval endorsed thereon. Such plans and specifications shall show in detail the ventilation, heating and lighting of such buildings. The plans shall provide at least fifteen square feet of floor space and at least two hundred cubic feet of air space for each pupil to be accommodated in each study or recitation room therein, and no such plans shall be approved by them unless provision is made therein for assuring at least thirty cubic feet of pure air every minute for each pupil and the facilities for exhausting the foul or vitiated air therein shall be positive and independent of atmospheric changes.

No schoolhouse shall be built with the furnace or heating apparatus in the basement or immediately under such school building.

State of Vermont.

Regulations of the State Board of Health.

Plans of each floor, including basement and attic, if the attic is to be occupied, and front and side elevations, also plans and sectional detail

drawings of the proposed systems of ventilation and plumbing and heating, shall be submitted to the local health officer, or State Board of Health.

In planning buildings to be used for schoolrooms above the first story, provision shall be made for at least two stairways, and such stairways shall be as far apart as practicable. No flight of stairs shall be more than fifteen steps between landings.

Stairways shall be railed on both sides. All outside doors to such buildings shall open outwardly. All pairs of doors shall be fastened by face bolts operated at top and bottom by one handle.

STATE OF VIRGINIA.

Be it enacted by the general assembly of Virginia, That the State Board of Inspectors for Public School Buildings shall not approve any plans for the erection of any school building or room in addition thereto unless the same shall provide at least fifteen square feet of floor space and two hundred cubic feet of air space for each pupil to be accommodated in each study or recitation room therein, and no such plans shall be approved by said board unless provision is made therein for assuring at least thirty cubic feet of pure air every minute per pupil, and the facilities for exhausting the foul and vitiated air therein shall be positive and independent of atmospheric changes. All ceilings shall be at least twelve feet in height.

All exit doors in any schoolhouse of two or more stories in height shall open outwardly. No staircase shall be constructed except with straight runs, changes in direction being made by platforms. No doors shall open immediately upon a flight of stairs.

All schoolhouses, as aforesaid, shall provide for the admission of light from the left, or from the left and rear of the pupils, and the total light area must be at least 25 per cent of the floor space.

OPEN-AIR SCHOOLS IN THE UNITED STATES.

(Illustrated with lantern slides.)

JOHN W. BRANNAN, NEW YORK.

The open-air school in the United States owes its origin to the movement for the prevention and treatment of tuberculosis. In fact, the first such school was established in the autumn of 1904 for the children in Sea Breeze Hospital, the hospital maintained on the beach at Coney Island for the treatment of children affected with tuberculous disease of the bones, joints and glands.

It was not until three years later, however, that the principle of open-air instruction was applied to other than hospital patients. In the winter of 1907-08, schools were opened in Boston and Providence for children who showed physical signs of pulmonary tuberculosis and who, because of that condition, had been excluded from the public schools of those cities. The success of these schools led to similar action in other cities, until now New

York, Hartford, Rochester, Chicago, Pawtucket, Buffalo, Cambridge and Pittsburg have each one or more classes in the open air, and the movement is gradually spreading throughout all parts of the United States. These schools are alike in that they all provide an abundance of fresh air for the children, but they differ widely in their situation and surroundings.

In Boston, the school is located in a public park on the roof of a building originally erected as a refectory. In Providence, the second floor of a schoolhouse no longer in use was adapted for the purpose by removing the brick wall on one half of the southerly side and replacing it with windows. In Hartford, the school is held in an army tent on the grounds of an old estate, the original dwelling house being used for dining room, kitchen, toilets, etc. In Chicago, also, a tent is used, on the roof of a building which bears the name of Mary Crane Nursery. In Rochester, the class was originally opened in a tent, but a portable schoolhouse has recently been provided. In New York, one school, in a congested part of the city, is on the roof of a medical school clinic, five stories above the street. The schools with the most novel situations are those on ferry boats, condemned as being no longer fit for their original use. Moored fast to piers on the New York water front, they now give shelter to five open-air classes for children.

All of the above-mentioned schools are for children who have physical signs of tuberculous disease sufficient to exclude them from the public schools, and were established either by private societies for the relief and control of tuberculosis or, as in the case of the Bellevue and Gouverneur ferry boats, by hospital boards of trustees, the public school authorities, however, furnishing the teachers, desks, chairs and books for the pupils.

Open-air classrooms are now being provided in New York and other cities by the boards of education themselves in the public school buildings. These classes are for children who are not yet tuberculous, but are believed to be especially predisposed to the disease, children who are pale, anæmic, ill-nourished and underweight, or with glandular enlargement, many of them coming from homes in which some member of the family is already affected with the disease. In New York, two such classes have been opened and eighteen more have been authorized by the city authorities. In April of last year the school board of Cambridge, Mass., in coöperation with the local anti-tuberculosis association, inaugurated a fresh-air school in connection with the other public schools. Each child has an individual garden which is a great source of interest. In Chicago, in one school, two rooms for second grade pupils were absolutely open throughout last winter and two more open-air rooms are being constructed on the roof of the boiler house of the same school. It does not appear that

the children in these classes in Chicago were especially selected because of their poor physical condition. In Pawtucket a well-equipped open-air school was started last spring for weakly children with a marked family history of tuberculosis. In Philadelphia, plans are under way for the construction of a large number of open-air rooms in the public schools during the present winter.

In all of the open-air schools, whether for tuberculous children or for children who are only predisposed to tuberculosis, the régime is essentially the same, varying only in detail. The children pass the entire school day in the open air. They have a hot substantial dinner at midday, and crackers and milk or eggs and milk in the morning and again in the afternoon. Before dinner, the hands and face are washed and after dinner the teeth are brushed. After the midday meal an hour at least is spent at entire rest in extension chairs or on beds, and the children are encouraged to sleep, which many of them soon learn to do. The children are warmly clothed, according to the season. In the colder months they wear a hat or cap, and gloves if necessary, flannels, overcoats, and in some cases they are furnished with canvas sitting-out bags, and overshoes or hot soapstones for the feet. The schoolroom is kept absolutely clean, as clean as a hospital ward. Dry sweeping and the use of the feather duster are prohibited. The floors are swept with brooms with a moist cloth about the end, and damp cloths are used for removing dust from chairs and desks. The desks and chairs are not fastened to the floor but are movable so that the floor may be thoroughly cleaned.

In most of the schools some manual instruction is given during part of the day. In the school on the Bellevue boat, classes are held twice a week in sewing, weaving, basketry, raffia work, etc., under a competent teacher. Gentle exercise is also provided for the children. In the hospital grounds adjoining the boat a vegetable and flower garden is cared for entirely by the children, who derive great entertainment and benefit from it, both mentally and physically. In the school in Pawtucket, every child has an opportunity to wait on the table and help wash the dishes, groups being assigned weekly. The older girls are taught to prepare soups, cocoa, puddings, eggs and meat that the children bring. In this way the teacher in charge combines practical housework with the school work. In all the schools nurses are furnished who visit the homes of the pupils and instruct the mothers in matters of hygiene, in order that the children may have as favorable surroundings as possible at home, as well as at the school. As a rule, it is found that the parents are quite ready to accept suggestions looking to the improvement of the home conditions of their children.

The following is the daily routine of the Bellevue school, the

first of the day schools for tuberculous children established in New York:

8.50-9.00—Children arrive, each child taking two eggs and two cups of milk before going upstairs.

9.00—School for older children until 11.00. Other children work in garden, weather permitting. Pulse and temperature are taken before and after working. Children with rapid pulse, temperature, or those on tuberculin treatment not allowed to work in garden.

11.00—Breathing exercises.

11.20—Wash room.

11.30—Dinner.

12.15-1.30—Rest hour. Here the children lie down on beds in the open air and many of them go to sleep.

1.30—School for two hours for the younger children. Other children rest until 2.00, and no children who are sleeping are wakened for school.

2.00—Garden for the older children, pulse and temperature being taken before and after working as in the case of the younger children. Children take two glasses of milk before garden and school in the afternoon.

4.00—Breathing exercises. Final inspection.

4.30—Milk and eggs, and home.

The schedule of the Gouverneur school is practically the same as that of Bellevue. There is, however, no garden available for the children. These are the two schools with which I am most familiar.

Results of Instruction in the Open Air.

The results obtained in the open-air schools have been most satisfactory. In every instance the report is the same. In the case of the tuberculous children, many have had the pulmonary process arrested and have returned to the public schools without loss in their school grade, and in some instances, in which a considerable period of time has been spent in the open-air class, with even a gain of one grade. In the case of the children not yet affected with tuberculosis, there has been a gain in weight, in appearance, in spirits, and in ability to accomplish the school work without fatigue.

The Future of the Open-Air School.

In view of the beneficent results obtained by placing the school children in the open air, there can surely be but one opinion and one outcome of this world-wide experiment. If fresh air is good for the tuberculous child and the child of poor physique, it must be good for all children and it should be our aim to see that they

get it. In New York, with a school population of over 700,000, we have some 200 children breathing pure air during their hours of study and instruction, or less than one in three thousand.

Viewed in this light, it would seem that we have accomplished little with all our expenditure of time and money and effort. We have really only cleared the way for the work to come. We cannot place all school children out of doors, but we *can* bring fresh air into all schoolrooms. The method is simple and obvious: open the windows.

Thanks again to the anti-tuberculosis propaganda, there is less fear of fresh air than formerly, though the dread of drafts still prevails among the people, but even that is diminishing.

Our experience with open-air schools has proved to us that children can easily and safely be provided with an abundant supply of fresh air whatever the situation of the schoolroom, whether on house top or ferry boat, or more important still, even in the customary school building.

This experience justifies us in insisting that the windows of all schoolrooms should be open in all seasons of the year, so that the air of the schoolroom may be as pure as the air out of doors. By means of steam radiators the air can be maintained at a proper temperature, which in the colder months of the year should never exceed a maximum of 65° Fahrenheit.

THE PLACE OF THE CRIPPLED CHILD IN THE PUBLIC SCHOOL SYSTEM.

EVELYN M. GOLDSMITH, NEW YORK CITY.

The place of the crippled child in the public school system is one of the great educational problems which has lately become prominent.

It is impossible in the time assigned to this subject this morning to deal in a comprehensive way with the several phases which suggest themselves. I have chosen to speak of the place which has already been given the crippled child; the splendid way in which he has taken the place given him; the progress which he has made; and the reasonableness of a still greater effort on his behalf.

You will permit me then to speak to you first of the interest taken in this problem in the city with whose conditions I am most familiar.

In New York City the question is a most pressing one because of the large number of afflicted children found in the lower East side and other parts of our city where the population is congested.

It has been stated there are 7000 crippled children in New York City to-day.

In other great cities, for example, in Chicago, Boston, Philadelphia, there are found great numbers of these little men and women who though mentally normal are physically wanting. Strange enough, although special classes have been organized for mentally deficient children, and well-equipped state schools have been established for the blind and the deaf and dumb, the crippled or deformed child has been entirely neglected as far as public provision is concerned, until the last few years.

Private charities became aware of this need of the cripple about eight years ago, but philanthropy recognized only the *physical needs.* They established hospitals; later guilds planned to provide outings and entertainments for these unfortunates, who had the power to enjoy but not the opportunity.

Soon there came the realization that *physical well being* is not the only important factor, but that man's happiness depends upon the *mental and spiritual element* as well as the physical.

When the demand for satisfactory educational training could no longer be disregarded, different philanthropies established schools by private contribution and a system of transportation which made it possible for children to attend these schools.

Hospitals, finding that the detention of the crippled children while under treatment was of long duration, opened schools within the institution. The physicians looking to the future say in their reports, "We believe the school work is absolutely essential and should be largely developed along industrial lines," but they add, "Our income is less than our expenses, yet the *school* is so *essential* that it is important that this expense should be borne." Another report says:

"The school is of great importance; our efforts in the past must be as nothing to what we will do in the future. It is an expense which we feel absolutely justified in incurring but that is at times very difficult to meet."

One of the first steps toward the solving of the problem of the education of these children by the public schools of New York was made in 1906 when the board of education joined forces with two private guilds. The guilds had paved the way and it was for the board of education to recognize the system and attempt some advance.

The school equipment and teachers were supplied by the board of education, the buildings, transportation, nourishment and general public care were looked after by the guilds.

This attempt was found successful and a further advance was made a year later in 1907 when classes for crippled children were added to the regular public schools wherever rooms were available.

At present there are sixteen classes for crippled children in the public school system of the city of New York and more will be added as children are found. Children from five to fifteen are now in attendance, coming at nine, bringing a noonday lunch and returning at two. The expense of the state for the transportation of these children is borne by the board of education.

The regularity of attendance, often 100 per cent, and the general progress made both mentally and physically, justify beyond doubt the existence of the schools.

No other city that I know of has taken over the education of crippled children in a public way—outside of New York City—with the exception of Chicago, and here much progress has been made—in fact, Chicago in some ways is leading New York.

In comparing the progress made by these children in the regular public school work we find they have often covered not only the outlines planned for the regular course but they have been able to carry on advanced work, especially along manual training lines, when frequently three of the lessons usually given are grasped in one, showing eagerness and ability for this work. For as when nature deprives the body of one sense she seems to supply to another increased powers, so, for example, when the legs are weak and useless, the arms and hands become more efficient and seem capable of doing more advanced work.

It is apparent that the present plan of work has developed in a somewhat experimental way. The work of the future school must be planned still more carefully to meet the special needs of this class of children. There should be *separate buildings* reasonably near the homes of the pupils, with cheerful rooms, many windows, no stairs and provided with all necessary equipment to add comfort and health to the disabled. The course of study should be such as to arouse their ambition and quicken their energy. It must appeal to their minds and yet afford to their hands and bodies rational exercise, develop skill in the use of tools, giving special trade instructions for those capable of trades, art, music, etc., or what goes to make most of the crippled child. Such must be the school of years to come when the public makes full provision for its needs.

The work for crippled children in our own country is still in its infancy. In Europe the problem has been before the educationists for some years, and in no department has greater progress been made during the last twenty-five years.

The greatest advance in the education of the deformed in connection with the regular system of public schools is to be seen in Great Britain, especially in London, Liverpool, Glasgow and Edinburgh, where many public schools of a special character have been established.

In Norway, Sweden and Denmark trade schools have been

established for *adults* where crippled men and women are taught to earn their own living and thus become independent. Here workshops have been established for over forty years and within most recent times have been greatly enlarged and extended.

They are supported by grants from the government and private donations, but while doing most effective work, are often handicapped by need of funds. Here many trades are well developed, the aim of which is to fit pupils to go out into the world to take positions and to become self-supporting. I have recently seen many wonderful examples of their self-dependence. For instance, three months ago in Christiania, Norway, I saw a man without fingers making beautiful furniture sets, carved with most intricate designs. Another most wonderful case was that of a woman with no arms who, by means of her teeth, threw bobbins from side to side, making the most elaborate and exquisite lace.

In Stockholm, Sweden, many similar cases were seen. One child less than five, born without arms, was trained in the kindergarten to sew and paint with her toes.

In Copenhagen, Denmark, many pupils had graduated and were instructors in the school. These examples illustrate the possibility of training the crippled child to grow up self-reliant, a useful member of society and not a burden to himself or to the community.

In Great Britain the schools for crippled children are a recognized part of the system of public instruction. These schools, it is important to note, are in buildings of their own (as here in Chicago), and are equipped with furniture and appliances especially adapted to the needs of the crippled child. Each school has an ambulance or two, constructed especially to admit children on stretchers and invalid chairs—for *even the child who cannot be taken from his stretcher is not considered too disabled for instruction.*

All children are conveyed to and from their homes and a nurse accompanies each ambulance. Her salary and the cost of the medicines she gives, such as cod liver oil—with an addition of "milk and crackers" at recess—are paid by the board of education.

In Liverpool and Edinburgh an especially noticeable feature is the emphasis placed upon the surroundings of the school. The playgrounds and gardens are beautifully arranged. The children have their own garden plots and care for their flowers and vegetables.

This out of door work is considered very essential for crippled children.

In London, the work was started by an "Aid Society" with Mrs. Humphrey Ward as leader; this venture was found successful, and in February, 1899, ten years ago, the London school board

took up the work. Since then twenty-three centers with 1,400 children have been enrolled.

Mrs. Humphrey Ward in making her experiment saw that no school could be successfully carried on without a hot midday meal for the pupils. She organized a "Crippled Children's Dinner Society."

A good hot dinner of meat, vegetables, bread and pudding is provided for four cents; sometimes this is varied by potato pie or vegetable soup, and at all times is good wholesome food.

The board of education furnishes the kitchen, firing and cook (as they do in Chicago). The cook is responsible to the head teacher for the proper performance of her duties. These dinners are under the direction of the "Crippled Children's Dinner Society," the managers are from each school and meet monthly to discuss plans. Free dinners are given only under exceptional circumstances and last year only 4 per cent of free dinners was given, a small per cent when we find these children come from lowest and poorest slums of London.

To these centers are also sent children suffering from heart disease, paralysis, overtaxed brains and nerves who cannot stand the bustle of a large school. These schools have medical inspection and this work is practically indispensable.

The after training of these children, that is after the children leave school, is under the care of the same society. As a child nears sixteen (which is the age he is supposed to leave school) his achievements are carefully noted, brought before the committee and work suited as far as possible to the requirements of that particular child is found.

In conclusion, it must be admitted the expense of maintaining schools for cripples is heavy but the care of the disabled child is eminently worth while. The modern discoveries in surgery keep alive children who could hardly have survived the first decade a generation ago. It would certainly be better in many cases if science could let some of the unfortunates go, but they are here and must be cared for until they are in a position to care for themselves. The advanced attainments of the medical profession involves antagonism to the natural law of the "survival of the fittest," and the phrase "incurable disease" has almost passed out of use.

The great majority of the afflicted belong to the wage-earning class, with small means to secure protection and relief. Fresh air and sunlight, the greatest preventives and curatives, are unknown to them. These elements at least are surely to be had in a well-ordered schoolroom. If the state is not going to provide an education for these children, it is nurturing a whole army of prospective paupers. Is it worth while to care for the individual

during the comparatively short period of childhood rather than during the longer period of adult life?

If they are given the proper kind of instruction it has been shown over and over again that these children when they grow older are able to provide a livelihood for themselves.

The state has no option but to provide for the crippled child and to give him at any rate a chance of leading an independent life.

Since the future of this work must depend upon a definite realization of its importance, it is of prime necessity that the case of the crippled child be clearly understood.

The responsibility of the state cannot be evaded. The crippled child has equal claim with his more fortunate brothers and sisters to an opportunity for training and education. He should *not* be thrust aside when the general educational scheme is made up. He must have a place in it and a generous provision for his special needs. He must *not* be left to the exclusive care of philanthropy, tender though that be, for he is a *future citizen* with all the rights which inhere in that relation.

INDEX.

	PAGES
Best, Lyman P. The Proper Sanitation of the Schoolroom	126–141
Brannan, John W. Open Air Schools in the United States	177–181
Brown, Philip King. A Brief Review of the Situation in San Francisco of the Questions of Interest to the American School Hygiene Association	153–155
Burnham, William H. Recent Studies of Fatigue in Relation to the Need of Oxygen	81–87
Burnham, William H. Report of the Committee on the Standardization of School Books	141–144
Cabot, Arthur T. School Inspection in Small Towns	40–43
Cabot, Richard C. The Consecration of the Affections, Often Misnamed Sex-Hygiene	114–120
Cigarette, The Boy and the. Willard S. Small	102–105
Constitution	5
Contagious Diseases. Abraham Jacobi	51–58
Cooper, Frank I. Schoolhouses and the Law	163–177
Cornell, Walter S Good and Bad Forms of Record Keeping	65–73
Council, 1911, Members of	3
Crippled Child in the Public School System, The Place of the. Evelyn M. Goldsmith	181–186
Cronin, John J. Report of the Committee of the Status of Medical Inspection in America	144–148
Desks for School Children, An Inquiry into the Problem of. W. A. Stecher	33–39
Eliot, Charles W. School Instruction in Sex-Hygiene	22–26
Eyes of School Children, Should the Examination of, be Conducted by the Teacher or the School Physician? Myles Standish	98–101
Fatigue in Relation to the Need of Oxygen, Recent Studies of. William H. Burnham	81–87
Feeble-Minded Child, How to Find the. Helen MacMurchy	73–81
Goldsmith, Evelyn M. The Place of the Crippled Child in the Public School System	181–186
Gulick, Luther H. Introductory Remarks of the President: Measurements as Applied to School Hygiene	18–21
Gulick, Luther H. What our City Schools are Doing for the Health of our Children	120–125
Health of our Children, What our City Schools are Doing for the. Luther H. Gulick	120–125
Hill, David Spence. Status of School Hygiene in Tennessee	155–163
Hines, L. N. Some Suggestions for a Course of Study in Hygiene	58–64
Hygiene Committees for Universities, The Formation and Functions of. Mazyck P. Ravenel	88–97
Hygiene, Individual Instruction in Personal. Thomas A. Storey	149–152
Hygiene, Some Suggestions for a Course of Study in. L. N. Hines	58–64
Jacobi, Abraham. Contagious Diseases	51–58

PAGES

Jacobs, Henry Barton. The Sanatorium School 109–113
MacMurchy, Helen. How to Find the Feeble-Minded Child . 73–81
Medical Inspection in America, Report of the Committee on the Status of. John J. Cronin 144–148
Members, List of 7–15
Morton, Rosalie S. The Work of the Public Health Committee of the American Medical Association 105–109
Newmayer, Samuel W. Evidences that the School Nurse Pays 44–51
Officers, 1907-1911 3
Officers and Council, 1911 3
Open-Air Schools in the United States. John W. Brannan . 177–181
Open Air, Vital Results Obtained in a Kindergarten from one Year's Work in the. William E. Watt 26–33
Program for the Fifth Congress 16–17
Public Health Education Committee of the American Medical Association, The Work of. Rosalie S. Morton . . . 105–109
Ravenel, Mazyck P. The Formation and Functions of Hygiene Committees for Universities 88–97
Record Keeping, Good and Bad Forms of. Walter S. Cornell . 65–73
Sanitation of the Schoolroom, The Proper. Lyman P. Best . 126–141
Sanatorium School, The. Henry Barton Jacobs . . . 109–113
School Books, Report of the Committee on the Standardization of. William H. Burnham 141–144
Schoolhouses and the Law. Frank I. Cooper 163–177
School Inspection in Small Towns. Arthur T. Cabot . . 40–43
School Nurse Pays, Evidences that the. Samuel W. Newmayer 44–51
Schoolroom, Proper Sanitation of the. Lyman P. Best . . 126–141
School Hygiene, Measurements as Applied to. Introductory Remarks of the President. Luther H. Gulick 18–21
School Hygiene in San Francisco, A Brief Review of the Situation in Regard to Questions of Interest to the American School Hygiene Association. Philip King Brown . . 153–155
School Hygiene in Tennessee, Status of. David Spence Hill . 155–163
Sex-Hygiene, School Instruction in. Charles W. Eliot . . 22–26
Sex-Hygiene, The Consecration of the Affections, Often Misnamed. Richard C. Cabot 114–120
Small, Willard S. The Boy and the Cigarette 102–105
Standish, Myles. Should the Examination of the Eyes of School Children be Conducted by the Teacher or the School Physician? 98–101
Stecher, W. A. An Inquiry into the Problem of Desks for School Children 33–39
Storey, Thomas A. Individual Instruction in Personal Hygiene 149–152
Watt, William E. Vital Results Obtained in a Kindergarten from one Year's Work in the Open Air 26–33